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THE DYNAMICS OF SOCIAL RELATIONS

FLORIAN ZNANIECKI

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I use the term "social relation" to denote a system of functionally interdependent actions performed by *two* cooperating individuals who evaluate each other positively and assume definite duties toward each other. Anthropologists, ethnologists, historians, sociologists, and social psychologists have collected more factual material about social relations than about the other, more complex, social systems, and thousands of generalizations based on this material have been made.

Almost all these relations are found in communities, that is, collectivities of people who live in limited areas sufficiently near so that each individual can at least occasionally get into contact with every other individual. Many investigators have based their conclusions about social relations upon evaluative and normative judgments which they obtain from those people who control the social life of the participants in a community, instead of ascertaining what a social relation means to the individuals themselves who are active partners in it.

Moreover, most investigators limit their study to relations which they find in a community at a given time, and do not take sufficiently into consideration the fact that in every community which lasts for a lengthy period there is a *continuous flux* of social relations. Particular relations are constantly emerging. Further, the standards and norms which regulate a certain kind of relation are differently applied in the course of time by particular individuals. Separate relations in which individuals participate gradually before interconnected, and relations which were interconnected often become separated. And—what is most important—new kinds of social relations are initiated in certain communities and gradually expand to other communities.

Therefore, the most productive method for studying social relations would seem to be what I call the *genetic* method. Every social relation within a community should be investigated from its origin throughout its duration. This would enable us to ascertain what the partners are actually doing so long as their relation lasts, what connection their relation has with other relations in which they participate, and also whether their positive mutual valuation increases or decreases—a problem in which contemporary

investigators are much interested. And in surveying comparatively social relations in many communities, past and present, we must try to discover what new kinds of social relations have evolved and expanded in the course of human history.

I have attempted to use this method in comparative studies of three kinds of social relations, maternal, fraternal, and erotic. These relations are rather long-lasting, and found in all durable communities; and considerable factual evidence about them is available.) Here is a brief, inadequate summary of the results of my studies. They sum to comprise Sorokin's theory of "creative altruism."

The mother-child relation is usually the first in which a newly-born individual begins to be a partner. (We are using the term "mother" to designate a woman who has given birth to an infant, accepted it as her own child, and assumed toward it definite duties which she has learned to perform. We have no time to discuss other uses of the term "mother.")

Maternal duties vary considerably, but their common function is to make the child fit to participate in the community in which the mother participates. The first task which the mother assumes as soon as the child is born and performs for years is to keep him alive and healthy, to satisfy his needs, to protect him from dangers, and to promote his organic growth. Her next task is to educate the child; and this cannot be adequately performed unless the child learns to cooperate with her and becomes a conscious, active partner in their long-lasting social relation. For this purpose, she must help him to identify her and to appreciate her positively, as well as to identify himself as an object of her actions who is evaluated positively by her and as an agent whom she expects to perform certain actions. Her total educational task constitutes a dynamic process promoting and guiding the continuous expansion of the child's conscious life. At every stage of this process, she performs definite actions; and when their purposes have been achieved, she undertakes new actions. She teaches the child to take care of his own body, to speak the language of the community, to interact with other individuals with whom he gets into contact; she imparts to him some knowledge of customs and mores, traditions, and religious beliefs and practices. If the child is a girl, she trains her in the technical skills reserved for females and prepares her for her function as a new mother.

The child's chief duty toward his mother, which he is expected to assume as he becomes conscious, is the duty of trustful obedience, that is,

doing willingly what she tells him to do and trusting her judgment of right and wrong and her altruistic intentions towards him. A later duty is spontaneous gratitude for what she has done for him.

As we know, the mother cannot perform all these duties alone. She needs the help of a man in satisfying the child's needs, protecting him, and educating him, if he is a boy. (When she is very busy and has a number of children, she must delegate some of her duties to older children, sometimes to her own mother or sister.) In the course of history certain motherly duties have been undertaken by specialists, i.e., priests, teachers, public officials, physicians, nurses, psychologists, psychiatrists (who can perform them more efficiently than mothers). As a result, new kinds of social relations between children and adults have evolved. (But the study of mother-child relations still provides the key for the explanation of such relations.)

Fraternal relations are those between men who are considered brothers. In tribal communities, they constitute the primary variety of so-called "kinship relations," i.e., those in which individuals become partners because they are united by bonds of common descent. The closest of such bonds are those between male siblings, sons of the same parents. Similar bonds, however, even though not so close, unite all male descendants of more or less common ancestors, whether descent counts on the male or the female side, or both. A relation between two such individuals is supposed to last as long as they live. Each must accept the other as valuable and gradually begin, from childhood on, to perform definite duties toward him. These duties are essentially alike, though more exacting between siblings than between more distant kin. They are reciprocal, though not necessarily equal. Briefly speaking, they include sympathetic understanding, mutual aid by gifts and active services, and eventually collaboration, i.e., performance by both parties of certain actions for a common purpose.

Many relations analogous to these have been voluntarily formed by individuals who had no bonds of common descent, but agreed to treat each other as if they were brothers. In some tribal societies, such relations are established by sharing each other's blood. A curious revival of this method is the German *Bruderschaft*, where sharing wine instead of blood produces a lasting bond. Well known, ever since classical antiquity, is voluntary life-long *friendship*, with mutual duties analogous to those between brothers. Wide-spread, though less exacting, are inter-individual or "fraternal" relations among members of certain groups—religious groups with-

out priestly control, secular groups ranging from the ancient secret associations to the contemporary "clubs," or "orders," and college fraternities.

The broadest conception of the fraternal relation was initiated by religious thinkers who formulated the idea that "all men are brothers" because they have a common Father, the God who created them. This idea has been accepted, without its theological implications, by quite a few secular philosophers and has begun to be practically applied.

Inter-sexual relations are found between men and women who accept each other as partners for a certain time and carry on sexual intercourse with each other. There are two distinct types of such relations: *marital* and *erotic*.

Most sociologists and anthropologists have concentrated on the study of the first type and neglected the second. This is not due entirely to prudishness. Marital relations always were and still are considered of primary importance, because the continued duration of an orderly community depends upon them. The purpose of marriage is supposed to be procreation of socially desirable children and their preparation for future participation in community life. And since the parents of each of the spouses assumed responsibility for his or her birth, growth, and education, they hold themselves responsible for his or her becoming a partner in a marital relation which will produce desirable new descendants. This explains why in most communities the parents select as mates for their son or daughter a girl or a boy who will prove valuable as future mother or father, arrange the wedding, and continue to exert some control over their later lives.

Erotic relations, or relations of mutual love, are not originally intended to contribute to the perpetuation of the community; their direct purpose is the mutual satisfaction of the partners. They select each other voluntarily, on their own initiative; and their relation is not subjected to the control of the older generation. Until recent times, nearly all of these relations were either pre-marital, as in some preliterate tribes, or extra-marital; and most of them still are. This does not mean, however, that they do not follow definite standards and norms. The obvious, universal duty of each partner is to give a maximum of sensory pleasure to the other in sexual intercourse, and this depends, of course, on technical skill. (Nearly 100 techniques have been invented, according to various authors, and some of them are transmitted from generation to generation.)

Sexual duties, however, are not the only duties of lovers. Mutual love, like brotherhood and friendship, involves sympathetic understanding, as well as active cooperation. Ever since ancient Greece, cultural patterns of erotic relations have come to include more and more of the personal lives of the partners. Lovers share many values and activities—*aesthetic, social, economic, religious, and intellectual*. This implies the gradual expansion of the cultural participation of women and growing equalization between the sexes.

However, as long as erotic relations were incompatible with marital relations, their duration was usually limited and their intimacy difficult to maintain. Consequently, during the last 100 years, among the intellectual classes of Europe and America, the ideal of a marital relation as a *permanent erotic relation* began to be explicitly formulated, accepted, and applied. This presupposes free mutual choice of husbands and wives and voluntary agreement to make their relation dynamic and harmonious by developing their personalities and expanding the range of their common values and activities. The old obligatory duties of a married couple have to be reinterpreted and undertaken as voluntary duties of mutual love. In particular, children become not so much the future continuators of the family as new bonds of love. Their lives are included in the personal lives of both parents, to be harmoniously shared with them.

Of course, such relations require more sexual and cultural education of the partners than the traditional marital relations did. Therefore, they are not yet so widely spread or so long-lasting as social ideologists want them to be.

(The limits of this paper do not permit me to generalize about the dynamics of other categories of social relations or to explain why I have omitted entirely inter-individual conflicts, in which many investigators are primarily interested.)

SOCIOMETRIC STUDIES OF COMBAT AIR CREWS IN SURVIVAL TRAINING

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THE RESEARCH SETTING AND THE INSTRUMENTS USED

In the flight situation, the relationships among crew members are determined in large measure by the formal structure of the crew and the technical specialties of its members. The aircraft commander (A/C), for example, is supported in his role as the leader of the crew by his recognized command function. With the duties of each member highly specified, the individuals who comprise the crew develop certain attitudes toward each other and toward their leader. But what happens if the crew is placed in an entirely novel situation? Do these attitudes, particularly attitudes involving the preferences of the men for a leader, remain stable? These are important questions in view of the fact that aircrews, by virtue of their activities and the accompanying hazards, constantly are faced with the possibility of emergencies which place unique demands upon the cooperative skills of crew members. Especially is this true for crews involved in ditchings, crash landings or bail-out in difficult terrain. Survival and rescue reports and interviews with Air Force personnel with survival experience suggest that the confidence of aircrew members in themselves, in their leaders and in the other members of their crews, may be crucial to their success in coping with emergencies (1). This confidence, or "survival expectancy," may in turn be related not only to the men's technical knowledge and skill but also to their attitudes toward one another and toward their leaders.

It is not practicable to study such attitudes under actual emergency conditions. The Survival Training School, however, furnishes a simulation of the novel kind of situation. Specifically, in contrast to flight training, survival training requires greater expenditure of physical effort by the men, imposes relative deprivation of their needs for food and shelter, and forces them to adjust to living in constant proximity over a prolonged period. It is important, therefore, to investigate under these simulated survival conditions the preferences of crew members for certain individuals as leaders and as survival companions, to learn more about the criteria upon which

such choices are based, and to identify the behavior with which changes in these choices are associated. Knowledge of these expressed attitudes may facilitate the identification of significant variables which can be used in the selection of A/C's and in development of training programs designed to increase both the proficiency of the assigned leader and the survival capability of the crew. A further possibility is that behavior observed under the conditions of survival training may prove predictive of the subsequent performance of A/C's and their crews in combat.

THE RESEARCH SETTING

The data upon which this report is based were collected during the winter of 1951 from aircrew trainees attending the Strategic Air Command Survival School at Camp Carson, Colorado Springs, Colorado. This unit, the 3904th Composite Wing, Survival School, was responsible for the advanced survival training of Air Force crews sent to Camp Carson from various operational units, to be trained in methods and techniques of survival under extreme conditions. The training consisted of three phases: (1) several days of attendance at lectures and demonstrations at Camp Carson; (2) several days spent at a "static" camp about fifty miles from Colorado Springs, where instruction was given in techniques and skills needed to be able to "live off the land"; and (3) a thirty-five to forty mile field march (trek) planned to provide the crews with additional simulated survival experience. Further hardship was imposed by the severe cold and the high altitude. Throughout the training, each crew was accompanied by an instructor assigned to teach the crew and to evaluate its performance and that of the individual crew members.

The sample employed in this study consisted of Classes 33, 35 and 37, comprised respectively of 24, 22 and 24 eleven-man B-29 crews. It should be noted, however, that the full complement of each crew was not present at the School, and that in some instances not every crew member was present at one or both of the testing sessions. The composition of these crews had remained the same for a period of about four months, during which time the members had undergone intensive flight training in preparation for subsequent assignments as replacement crews in the Far East Air Force (FEAF).

INSTRUMENTS AND TESTING PROCEDURE

The instruments used were two forms of a sociometric questionnaire. A copy of each form is reproduced in Appendix A. These will be referred to as the pre-training and post-training sociometric measures. The following five items were common to both forms and elicited choices of leaders or survival companions:

1. If you had to really survive as a crew, what man on the crew would you choose as a leader? You may include yourself.
2. What man (or men), besides the A/C would make the best survival leader? You may include yourself.
3. What enlisted man would make the best survival leader? You may include yourself.
4. If your crew had to be split up in an actual survival situation, which two members would you prefer to be with?
5. If your crew had to split up in an actual survival situation, which two members would you *least* like to have with you?

The following six items described specific ways of behaving during training and were included in the post-training questionnaire only:

8. On the trek, what man or men on the crew did the most hunting, fishing, or trapping? You may include yourself.
9. On the trek, what man or men told jokes or wisecracks that helped to keep spirits up? You may include yourself.
10. On the trek, what man or men griped the most?
11. On the trek, what man or men helped others the most? You may include yourself.
12. On the trek, what man or men helped others the least? You may include yourself.
13. On the trek, what man or men seemed almost at the breaking point?

The items included in these instruments were developed from the detailed reports of trained observers who accompanied previous crews on their treks. The questionnaires were administered; one before and one after training, to three of the classes that attended Survival School during the period from November 1951 to March 1952. In all testing sessions, a uniform procedure was followed in which subjects filled out the forms in accordance with written directions, copies of which are included in Appendix A.

GROUP STRUCTURE AND COMBAT EFFECTIVENESS

Objectives

It is well known that the formal structure of a group need not coincide with the informal interpersonal relationships among its members. It is also reasonable to assume that the absence of discrepancies between formal and informal group structure indicates a certain degree of harmony among the members which may in turn lead to greater effectiveness of the group with respect to the achievement of the group goal.

In the case of aircrews the same distinctions may be made. Rank, crew position, standard operating procedure and Air Force regulations can be described as aspects of formal organization whereas the feelings and attitudes of the crew members toward each other and toward their appointed leader, the aircraft commander, are informal characteristics of group structure which emerge in the course of the group's interpersonal relationships. It should also be kept in mind that the formal structure of an aircrew antedates the development of the more informal aspects. This is natural because aircrews are assembled from a pool of strangers whose technical qualifications and length of experience are probably the prime considerations for their being formed into a crew.

While the formal aspects of crew structure are more or less immutably fixed, the informal relationships undergo change as the members of the crew work and live together, as friendships and enmities evolve, and as the crew increases in age. The development of feelings and attitudes among crew members is obviously accelerated in situations where the men work and live together in close proximity for an extended period of time, and where the demands of the situation require a high degree of collaboration. The experiences provided in the training situation of the Advanced Survival Training School seem to be eminently suited for crystallizing the attitudes of crew members toward each other, and for obtaining stable measures of informal crew structure following training.

The study here reported is based upon the hypothesis that the informal group structure of a bomber crew, as measured in the survival situation, is related to the crew's subsequent effectiveness in combat.

Specifically, an attempt was made to answer the following questions:

1. What is the relationship between the sociometric position during survival training of the aircraft commander (A/C) and the combat proficiency of the crew?

2. What is the sociometric status during survival training of individual crew members who are removed from their crews after survival training?

Subjects, instruments and administration have already been described.

Upon completion of survival training, subjects received an additional month of flight training before being assigned to combat duty in FEAF. Some, however, were dissolved and the members were assigned as replacements for other crews, given other assignments, or discharged.

While these crews were in combat, data concerning crew changes and combat performance were collected.

Analysis of Data

A. FOLLOW-UP DATA

1. *Ratings of Combat Performance*

Follow-up data included combat ratings of the performance of forty crews. These crews had been rated on a nine-point scale on each of the following criteria of combat effectiveness: successful completion of missions, dependability in handling sudden emergencies, skill as technicians, care of aircraft, economy of performance, following S.O.P., effectiveness of crew leadership, effectiveness of coordination and teamwork, and overall effectiveness to Air Force mission. The 20 crews having the highest ratings were designated as "better crews" and the other 20 were designated as "poorer crews."

Of these forty crews, only twenty-four belonged to our sample. Of these twenty-four, ten were "better crews" and fourteen "poorer crews." In addition, there were twelve crews which had been reorganized after survival training. Some of the individual crew members of these twelve crews served as replacements on other crews, some were discharged and some received other assignments. These twelve crews will be referred to as "drop-out crews" and will be compared with the ten "better crews" and the fourteen "poorer crews." Adequate information was not available for the other thirty-four crews in the present study. Most of them had not been in combat long enough to obtain adequate performance ratings.

2. *Crew Changes*

Information pertaining to crew changes was obtained at the same time as the combat ratings. However, it was possible to obtain these data on only 23 of the 70 crews. These 23 crews were subdivided into two groups:

11 crews without changes—crews which remained intact after completing survival training.

12 crews with changes—crews which lost one or more of their original members after completing survival training.

There was considerable overlap between these two groups and the "better crews" and the "poorer crews" mentioned previously. Of the 11 crews without change, 5 were "better crews" and 5 were "poorer crews." The performance ratings on the remaining crew were not obtained. Of the 12 crews which changed, four were "better crews," five were "poorer crews" and three were not rated.

3. *Individual Drop-Outs*

Analysis of individual records revealed that nine crew members had been dropped from their original crews for incompatibility or incompetence. It was decided to divide the total group on which information was available into two subgroups, i.e., the nine subjects who dropped out ("drop-outs") and the remaining 465 members of their classes (Classes 33 and 35).

B. SOCIOMETRIC DATA

First of all, an observational analysis of the number of choices received by the A/C's in the sociometrics and in the post-trek questionnaire revealed that on some items the number of choices was too small to warrant the use of statistical procedures and in others the differences were not significant statistically. The seven items which remained are as follows:

Pre-Trek

Best survival leader.

Post-Trek

Best survival leader.

Most preferred survival companion.

Least preferred survival companion.

Man who griped the most.

Man who helped the least.

Man nearest the breaking point.

The percentage of choices received by the A/C of each crew was obtained by dividing the total number of choices received by each A/C by

the number of men in his crew who filled out a sociometric questionnaire. This quotient was then multiplied by one hundred.

A *t*-test of significance of differences between the number of choices received by A/C's of the three groups (Better vs. Poorer, Better vs. Drop-out, Poorer vs. Drop-out) in the seven sociometric and post-training questions mentioned above was calculated.

The *t*-ratios were calculated between the average number of nominations as "best survival leader" received by A/C's of crews that changed and the average number received by A/C's of crews that did not change.

A different approach was used in testing the differences between the average number of choices received by crew members who dropped out and by crew members who did not drop out. The number of choices they received as "best survival leader" in both the pre-training and post-training questionnaires appeared to be too few to justify statistical analysis. The choices received on other sociometric items and post-training questions were much more numerous. A Chi-square test of significance was calculated between the number of choices received by the nine "drop-outs" and the 465 who did not drop out.

Results

Table 1 presents the average number of choices on different sociometric and post-training questions received by aircraft commanders of "better crews," "poorer crews," and "drop out" crews.

Table 2 indicates that choices given to the aircraft commander as a leader, before and after training, are significantly associated with subsequent crew changes.

Table 3 presents evidence that crew members who "dropped out" differed significantly from crew members who went into combat.

DISCUSSION

Of the relationships between sociometric questions and combat effectiveness of both crews and individuals the number of choices as "best survival leader" received by the A/C following survival training is one of the best predictors of crew effectiveness. No other measure is so consistent throughout. With reference to Table 3 it is shown that negative choices are sometimes more revealing than positive ones: the nine drop-out members consistently received higher negative and lower positive scores. Because of the small size of the "drop-out" sample, sweeping generalizations are out

of place, but the data indicate a trend which might be confirmed by research with a larger number of subjects.

TABLE 1

AVERAGE NUMBER OF CHOICES ON DIFFERENT SOCIOMETRICS AND POST-TRAINING QUESTIONS RECEIVED BY A/C's OF "BETTER" CREWS, "POORER" CREWS AND "DROP-OUT" CREWS WITH *t*-TEST OF SIGNIFICANCE OF DIFFERENCES BETWEEN MEANS OF THE THREE GROUPS

	Means			<i>t</i> -ratios		
	Better combat crews (N=10)	Poorer combat crews (N=14)	Drop-out crews (N=12)	Better vs. Poorer	Better vs. drop- out	Poorer vs. drop- out
Choices of A/C's as leader (Pre-training)	7.8	7.5	6.1	0.3	*1.8	1.6
Choices of A/C's as leader (Post-training)	7.0	5.8	4.0	**2.4	****4.1	***3.2
Choices of A/C's as survival companion (Post-training)	3.0	2.7	2.5	0.5	0.7	0.2
Choices of A/C's as least liked survival companion (Post- training)	0.3	0.0	1.2	1.4	*1.9	***2.9
Choices of A/C's as "griped most"	0.9	7.3	4.0	1.6	**2.2	0.8
Choices of A/C's as "helped the least"	2.0	5.2	3.2	1.0	0.4	0.7
Choices of A/C's as "man near breaking point"	0.9	5.1	6.9	**2.5	*2.1	0.6

Level of significance:

*.10

** .05

***.01

****.001

These results indicate that the effectiveness of an aircrew is enhanced when the officially designated leader and the freely chosen leader coincide. The practical importance of this finding is highlighted by the consideration that aircrew assembly is accomplished by military authorities who attempt to take into account such factors as the individual's technical qualifications, experience, etc. This procedure does not take cognizance of the individuals' personal feelings, their idiosyncracies, and the conflicts which may erupt when personalities of different backgrounds and experience are ordered to

TABLE 2
AVERAGE NUMBER OF CHOICES IN DIFFERENT SOCIOMETRIC CRITERIA RECEIVED BY A/C'S
OF "CREWS THAT CHANGED" AND A/C'S OF "CREWS THAT DID NOT CHANGE,"
CRITICAL RATIOS AND LEVEL OF SIGNIFICANCE

	Crews that changed (N=11)	Crews that did not change (N=12)	t-ratio
Choices of A/C's as leader (Pre-training questionnaire)	7.0	8.2	**2.42
Choices of A/C's as leader (Post-training questionnaire)	4.9	6.9	***3.57

Level of significance:

*.10

** .05

***.01

TABLE 3
AVERAGE NUMBER OF CHOICES RECEIVED BY CREW MEMBERS WHO "DROPPED OUT" AND
CREW MEMBERS WHO DID NOT DROP OUT

	Dropped out N=9	Did not drop out N=465	Chi square
<i>Pre-Training Questionnaire</i>			
Best survival companion	0.33	2.02	****12.75
Least liked survival companion	3.77	1.20	****49.01
<i>Post-Training Questionnaire</i>			
Best survival companion	0.20	1.76	****11.48
Least liked survival companion	3.78	1.18	****49.02
Hunted the most	0.33	1.42	***6.88
Joked the most	0.44	1.28	**5.44
Helped the most	0.44	1.43	**6.35
Griped most	2.11	0.70	****21.00
Helped the least	2.44	0.69	****32.81
Man nearest the breaking point	1.32	0.58	***9.98

Level of significance:

*.10

** .05

***.01

****.001

form a group. In the light of these circumstances, it is easily seen that the major task for welding a newly formed group into an effective combat unit devolves upon the aircraft commander. Not only does he have to assume full responsibility for the lives of his men, for the aircraft and for the accomplishment of the mission, but he must also initiate steps to foster the development of what might loosely be called "group spirit." He must help his crew members to accept one another, smooth out differences of opinion and personality, and insure his own acceptance by his men. In short, he must fulfill the role expectations of his superiors in a manner that will also fulfill the role expectations of his subordinates. His success is assured if he is able to mesh the formal role requirements with the more informal ones, and if, in the performance of the job, he is able to weld the crew together and cause it to function harmoniously. One of the more significant findings is the high degree of relationship between crew effectiveness and the number of times the A/C is chosen as leader. The more choices given to the A/C as leader the greater the effectiveness of his crew in combat.

The study also furnishes some evidence on the significance of survival training as a factor in the development of crew spirit and particularly of the A/C as the leader of the crew. Whereas the crews had been together about three months prior to the simulated survival experience, the results of the pre-training sociometric questionnaire were not predictive of subsequent combat performance. The post-training results, however, were. We may infer that the simulated survival situation afforded the crew members further opportunity to assess the A/C's potential as a leader. The trek apparently was sufficiently realistic to crystallize the crew members' attitudes toward their leader so that the degree to which the A/C was chosen as a leader following survival training proved to be a valuable index to the crew's subsequent performance in combat.

The findings of this study also furnish some clues as to why it became necessary for individuals to be removed from a crew. During survival training, they didn't do much hunting, didn't do much joking, did gripe a great deal, did little to help other members of the crew, and were near the breaking point. Consequently, they were not chosen and not liked by the other men on their crew. To the individual crew member who wants to be accepted by his crew, it would mean that he must participate fully in the activities of the crew, accept the discomforts without griping, and maintain good physical conditioning. For those responsible for reorganizing crews, it would mean that such data as collected in this study could be

used as a basis for removing individuals who are unable to adjust to their crews. The advantage would be that crew changes could be made earlier, before the crew is scheduled for combat so that the new crew member would have a chance to become integrated into the crew before entering combat.

STUDY II: CHANGES IN GROUP STRUCTURE DURING SURVIVAL TRAINING

In study I, it has been shown that certain aspects of a crew's structure are related to combat effectiveness. In regard to the authority or leadership structure, it was suggested that changes in this structure during survival training were perhaps more important than the original structure itself insofar as differentiating crews according to relative degrees of effectiveness. This study is therefore designed to investigate changes in certain aspects of group structure taking place during the survival training, and the meaning of these changes.

Using sociometric data, changes in group structure can be studied from the standpoint of both the giver and the receiver of the choices. A study of the changes in the choices given will furnish a measure of the amount of change or an index of the extent to which roles had been stabilized before the beginning of the training. A study of the changes in choices received will give a rough measure of the stability of each individual's position in the crew and of the direction of the changes in choice.

SUBJECTS AND INSTRUMENTS

The subjects and instruments have already been described.

ANALYSIS OF DATA

In order to study changes in choices given, a tabulation was made of the number of changes in choices made on each of the three basic sociometric criteria used in both the pre- and post-training questionnaires. Tabulations were made for the better combat crews, the poorer combat crews, and the drop-out crews. The total number of changes on each criteria of choice was converted to the percentages of the total number of changes possible. It was noticed that in some crews, members refused to nominate anyone as the least desirable survival companion. In order to evaluate this tendency, the percentage of the total number of choices possible was computed for the better combat crews, the poorer combat crews, and the drop-out crews.

To study the changes in choices received, tabulations were made of the number of choices received by officers and the number received by airmen on both the pre- and post-training questionnaires.

A tabulation was also made of the changes in status of all those who emerged as either rejectees, neglectees or stars on the pre-training questionnaire. The rejectees were those who were named as "least desired survival companion" four or more times. The neglectees were neither chosen nor rejected on the survival companion questions. The stars were those who received four or more choices as the "most desired survival companion."

RESULTS

Changes in choices given are shown in Table 4. Fewer changes occurred in the better combat crews than in the poorer combat crews and in the drop-out crews. Members of the drop-out crews also made more changes than did members of the poorer combat crews. It is seen that slightly over fifty per cent of the choices of survival companion were changed in all three categories of crews. None of the differences were significant. The members of the drop-out crews made more changes in the nominations as least desired survival companion than did the members of both categories of combat crews. The difference between the better and poorer combat crews is not statistically significant.

TABLE 4

PERCENTAGES OF CHOICES CHANGED BETWEEN PRE- AND POST-TRAINING QUESTIONNAIRES

Criteria	Percentages			<i>t</i> -ratios		
	Better combat crews (N=102)	Poorer combat crews (N=138)	Drop- out crews (N=123)	Better vs. poorer	Better vs. drop-out	Poorer vs. drop-out
Survival leader	36.27	46.38	53.66	*1.63	***2.66	1.30
Most desired survival companion	51.47	53.62	52.44	N	N	N
Least desired survival companion	43.14	44.93	63.82	N	***3.13	***3.10

Level of significance:

*.10

**05

***.01

N not significant

In Table 5 is presented an analysis of the changes in the average number of choices received by officers and airmen on the pre- and post-training questionnaires. From this table, it will be observed that the officers received a significantly smaller average number of choices both as best sur-

TABLE 5
CHANGES IN AVERAGE NUMBER OF CHOICES RECEIVED BY OFFICERS AND AIRMEN ON THE PRE- AND POST-TRAINING QUESTIONNAIRES

Criteria	Pre-Training	Post-Training	Critical Ratio
OFFICERS (N=310)			
Best survival leader	2.22	2.08	**2.00
Best survival companion	2.86	2.33	****3.23
Least desired survival companion	0.85	0.98	0.93
AIRMEN (N=490)			
Best survival leader	0.14	0.20	1.58
Best survival companion	1.31	1.26	0.34
Least desired survival companion	1.56	1.43	0.78

Level of significance:

*.10

** .05

***.01

****.001

vival leader and as best survival companion on the post-training questionnaire than on the pre-training questionnaire. Because of the *t*-test it was shown that the officers received a larger average number of choices than the airmen on both the best survival leader and the best survival companion on both the pre- and post-training questionnaires (all differences statistically significant at the .001 level of confidence). Officers also received a smaller average number of choices as the least desired survival companion (statistically significant at the .001 level of confidence).

An analysis of the changes in sociometric status (as measured by the two survival companion questions) of the rejectees, neglectees and stars is shown in Table 6. Although all of these changes are statistically significant, it is interesting to note that approximately two-thirds of those in these extreme categories retain their positions.

TABLE 6

THE SOCIOMETRIC STATUS AT THE END OF TRAINING OF REJECTEES, NEGLECTEES, AND STARS AS DETERMINED BY A PRE-TRAINING QUESTIONNAIRE

Pre-training status	Post-training status			
	Rejectees	Neglectees	Stars	Others
Rejectees (N=67)	61.2%	3.0%	1.5%	34.3%
Neglectees (N=39)	12.8	69.2	0.0	18.0
Stars (N=129)	3.1	3.1	64.3	29.5

DISCUSSION

The foregoing findings clearly indicate that sociometric choice in the survival training situation is far from a static phenomenon. This would support previous hypotheses that there are strong elements within the survival training situation which test the relationships of a crew and the forces which hold the crew together. It also gives additional support to the conclusion advanced in the previous study that something important happens within a crew during survival training to prepare it for combat.

In trying to understand some of the things responsible for these changes, reference should be made to another study conducted by the authors in which crew members were asked to give the reasons for their post-training choices for leader, most desirable survival companion and least desirable survival companion. The bases of choice for survival leader have been discussed in the previous study, but some of the findings in regard to survival companion choices and rejections need to be examined in relation to the findings of this study.

Men most desired as survival companions are seen as easy to get along with, stable personally, physically adequate, skilled and knowing in survival techniques, desirous of surviving even under the most adverse conditions, able and willing to do their share of the work, working for the welfare of the group, and having proved himself in the survival situation. Some made their choices on a personal basis such as: my personal friend, my best friend, we're buddies, we travel at about the same pace, we think alike, etc. The probable stability of this type of choice is reflected in the following statement by one man: "We have been close personal friends for a long time and we are not likely to allow minor disagreements to enlarge into serious conflicts."

Men are rejected as survival companions because they "get on their

fellow crew members' nerves as a result of excessive loudness, boasting, arguing and profanity; disagreeable personality characteristics; and failure to keep clean. The crying-type of complaining, failure to do one's share of the work, self-centeredness, personality inadequacies and immaturities, physical inadequacies, personal dislikes, and poor handling of authority relationships were frequent causes of rejection.

Recognizing that important changes do take place within crews during their training, a knowledge and an understanding of the factors outlined above as contributing to choices and rejections should prove useful to those responsible for the conduct of crew training.

It is also interesting to discover that stability of sociometric structure appears to be related to combat effectiveness. This would suggest the importance of providing experiences early in a crew's existence which would give its members an opportunity to learn what kind of behavior to expect from one another. Through such a process, it would be expected that stability would be achieved. If the behavior of deviant members cannot be accepted, pressures for a change in crew composition would be exerted at an earlier date to permit stabilization of structure before the beginning of a combat tour.

STUDY III: CREW MEMBERS' PREFERENCES FOR SURVIVAL COMPANIONS AND LEADERS BEFORE AND AFTER SURVIVAL TRAINING

This study is an attempt to answer two questions: (1) During survival training, do changes occur in the preferences of crew members for leaders and survival companions? (2) If changes occur, with what behavior are these shifts in preference associated? The data were obtained from a sample consisting only of Classes 33 and 35 comprised respectively of 24 and 22 eleven-man crews.

INSTRUMENTS AND TESTING PROCEDURE

These are discussed at the beginning of the report.

STATISTICAL PROCEDURES

With respect to each choice criterion, an individual's "status" was defined in this study as *the number of sociometric choices he received from the members of his crew*. In those instances where the test instructions per-

mitted self choices, these were included in the frequency count. The number of choices permitted varied with the particular item, the directions stipulating one choice, two choices, or no limit (other than that imposed by the size of the crew).

For each of the five items administered both before and after training, members of the sample were assigned to one of three categories: gains, no change, and losses. Assignment to one of these categories was dependent solely upon whether the *numerical total* of choices received with the post-training questionnaire was greater, equal to, or less than the pre-training total. Thus, if a crew member was chosen by five crew members on a pre-training sociometric item and received seven choices on the same item following training, he was classified in the "gain" category. It will be noted that this procedure involved simply the direction of change in the preferences of the crew members without regard for the magnitude of such change.

Certain arbitrary rules were imposed in tabulating the data. These rules further restricted the size of the sample, but, if not enforced, might have led to spurious interpretations of the findings. Unless an individual's responses were "scorable" for a specific item on *both* pre- and post-training questionnaires, he was eliminated completely from the sample. This meant that neither choices given by him *to* others nor received by him *from* others were included. Responses considered non-scorable were not only those in which no answer was given to a question, but also those in which a non-differentiated response was made to the crew or to the item, such as "all," "don't know," or "any."

Individuals chosen on the basis of the criteria of specific forms of behavior during training (obtained from the post-training questionnaire only) were classified in two categories: "chosen" and "not chosen." Finer grouping would have produced within-cell frequencies too small for statistical treatment. The number of choices received by any crew member varied from zero to ten. Through application of the chi-square technique, the hypothesis was tested that individual change scores on the leader (or survival companion) questions were independent of the number of choices received on post-training criteria descriptive of specific ways of behavior during training. The values of chi-square to be reported were computed from 2×3 tables, and the corresponding values of *P* were based on two degrees of freedom. In order to determine whether consistent results were obtained in Classes 33 and 35, separate tests were made for each class. When the chi-square test led to a different conclusion for each class, it was inferred that

less confidence could be placed in the evidence provided by this study as a basis for either accepting or rejecting the original hypothesis. Replication of the research employing a larger sample of classes then would seem to be indicated.

Given below is an illustration of the form of the tables from which the chi-squares were computed.

SURVIVAL COMPANION				
Hunted Most	Gains	No Change	Losses	Total
Chosen				
Not Chosen				
Total				

RESULTS

Table 7 presents the results obtained from the chi-square analysis of the data.

The discussion which follows focuses on the extent to which the findings appear consistent with the original hypothesis—that changes from pre- to post-training in the number of survival companion (or leader) choices received by individual crew members are related to the frequency with which these individuals are chosen on the basis of other criteria descriptive of specific behavior during training. The purpose of the discussion will be, not to attempt separate interpretations of each value of chi-square or of each class, but rather to summarize those general trends which appear to be supported by the data obtained from *both* Classes 33 and 35. Where a significant result is found in one class but not in the other, a discrepancy may be attributed to circumstances peculiar to the survival training of the specific classes. Present information, however, does not permit more than speculation in this matter.

We shall examine the results with two questions in view:

- (1) With respect to particular survival companion or leader choice criteria, were changes in status related to any, some, or all of the criteria describing specific behavior during training (e.g., are some of the specified ways of behaving, but not others, related to leader status?) Answers to this type of question are provided by the figures contained in the columns of Table 7.

TABLE 7
CHI-SQUARE TEST OF INDEPENDENCE OF TWO SOCIOMETRIC MEASURES ADMINISTERED TO AIRCREW MEMBERS IN SURVIVAL TRAINING

Post-training choice criteria	Class	Choice categories									
		Survival				Least preferred survival companion				Leader	
		N	chi-square	N	chi-square	N	chi-square	N	chi-square	Leader not A/C	Enlisted leader
1. Hunted	33	232	**9.22	152	2.25	225	**13.41	207	**13.95	117	**9.64
most	35	192	2.55	144	**12.54	201	1.34	181	4.50	95	3.69
2. Kept up	33	232	**14.10	152	*6.18	225	**10.79	207	**10.37	117	1.00
morale	35	192	**13.88	144	*8.78	201	**19.24	181	**13.06	95	1.53
3. Gripped	33	232	**10.61	152	*6.41	225	2.44	207	3.37	117	2.38
most	35	192	*9.10	144	**15.12	201	0.91	181	*6.04	95	4.77
4. Helped	33	232	**22.72	152	1.95	225	**20.81	207	**22.12	117	**9.84
most	35	192	*6.68	144	*6.49	201	*8.56	181	**16.40	95	5.23
5. Helped	33	232	**14.94	152	**15.10	225	*8.39	207	**10.18	117	4.44
least	35	192	**14.95	144	**17.34	201	*7.47	181	*6.71	95	*6.88
6. Near break-	33	232	4.30	152	1.23	225	2.61	207	4.16	117	3.20
ing point	35	192	*6.05	144	*8.98	201	3.64	181	1.96	95	4.14

*Significant at the .05 level of confidence.

**Significant at the .01 level of confidence.

N=2.

- (2) With reference to the various post-training criteria, did these various behaviors appear to have differential relevance to one or another of the leader or survival companion choice criteria (e.g., was being chosen as having "griped most" related to changes in status as survival companion, but not as leader?). Answers to this kind of question are given by the rows of Table 7.

The trends apparent in the results will be summarized in this order, beginning with a perusal of chi-square values contained in the columns of Table 7, and next, shifting to a survey of the figures given in the rows.

Each Survival Companion or Leader Criterion as Related to Various Specified Ways of Behaving During Training

"If your crew had to be split up in an actual survival situation, which two members would you prefer to be with?"

An attempt was made to relate (1) changes in status based upon the above choice criterion to (2) specific behavioral criteria. The results obtained may be summarized as follows:

1. Trends consistent in both classes suggest that *changes* in sociometric status as survival companion were associated with these behaviors: kept up morale, griped most, helped most, and (or) helped least during survival training.

"If your crew had to split up in an actual survival situation, which two members would you *least* like to have with you?"

The following trends emerged from the tests of association between post-training behavioral criteria:

1. A smaller proportion of each class made scorable responses to this question than had done so in answer to the previous one. A plausible explanation for this is the frequently observed reluctance of subjects to make choices that imply rejection rather than acceptance of others. Information as to what effect such a selection factor may have had on the results is not provided by the present data.

2. Trends common to both classes appeared in the analysis involving three of the six post-training choice criteria: kept up morale, griped most, and helped least. These three "perceived" behaviors tended to be related to changes in the number of least preferred survival companion choices.

"If you really had to survive as a crew, what man on the crew would you choose as leader? You may include yourself."

This is the first of three "leader" questions. The explicit allowance for self-choice permitted A/C's, if they wished, to list their own names. The several leader items are of interest in that they pertain to a specification by crew members of behavior relevant to the within-crew status of accorded leaders. From the analysis of the relation between this particular leader choice criterion and behavior manifested during survival training, the following findings are adduced:

1. Three of the described behaviors tended in both classes to be associated with changes in leader status: kept up morale, helped most, and helped least.

2. There was no indication that two of the post-training criteria were significantly related to changes in leader status in either Class 33 or Class 35. Evidently, whether or not an individual gained, lost, or retained the same number of leader choices was independent of his being chosen or not chosen as one who either "griped most" or "seemed to be near the breaking point."

"What man (or men), besides the A/C would make the best survival leader? You may include yourself."

It should be noted that here subjects were permitted to choose themselves and as many other crew members as they wished. The one restriction was that the commander was to be excluded from consideration. The chi-square analyses of changes in choices received in response to this leader question revealed the following major trends:

1. In both classes changes in status as "leader other than A/C" tended to be related to choices received as having kept up morale, helped most, and helped least. These trends coincide with those shown by the results found in analyses of changes in status based upon the first leader criterion. The implication is that changes in leader status seem to be related to the same behavioral criteria, whether or not choice of the commander is permitted, and whether only one or an unlimited number of choices is allowed.

2. Being perceived as near the breaking point was not significantly related in either class to changes in status as leader other than A/C.

"What enlisted man would make the best survival leader? You may include yourself."

The third leader question limited subjects to a single choice, but permitted self choices. The relatively small N included in analyses of these responses may be attributed to the elimination on this item of all officers

as potential nominees. In brief, these were essentially negative findings with respect to the enlisted criterion:

1. There are no consistent trends supporting the hypothesis that changes in status as enlisted leader are related to the specified ways of behaving during survival training.

2. On the other hand, there is fairly clear-cut evidence that three of the described kinds of behavior are independent of enlisted leader status, at least in this sample. Specifically, the chi-square values are not statistically significant in *either* class in analyses involving these behaviors: kept up morale, griped most, and seemed near the breaking point.

Each Post-Training Criterion as Related Differentially to Changes in Survival Companion or Leader Status

Inspection of the rows of Table 7 suggests that the various post-training choice criteria may be grouped into several categories in terms of their apparently varying relevance to the survival companion or leader questions. Such a procedure leads to certain inferences about their potential usefulness as predictors of status changes among survival companions or leaders. Obviously, these judgments must be qualified by recognition of the fact that they are based upon data obtained from only two classes. It follows that inconsistencies between classes cannot be accounted for except by conjecture. Specific results are regarded as more conclusive if they are consistent in both classes.

The exact wording of each of the analyzed post-training questions will be given below, together with statements pointing out the trends manifest across the rows of Table 7.

1. The following questions were related consistently to all survival companion and leader criteria, with the exception of the enlisted leader item.

"On the trek, what man or men told jokes or wisecracks that helped keep spirits up? You may include yourself." (Referred to in this report as "kept up morale.")

"On the trek, what man or men helped others the least? You may include yourself."

2. The next two post-training items seemed to be related consistently to some of the survival companion or leader criteria, but were less clearly related to others.

"On the trek, what man or men griped the most?"

The behavior described in this item was associated in both classes with status based upon the two survival companion choice criteria, but griping most did not seem to be associated with leader status.

"On the trek, what man or men helped others the most? You may include yourself."

The evidence was suggestive, but not wholly consistent, that this item might be related to status based upon all five survival companion and leader questions. The tendency toward association was most strongly supported with respect to changes in choices received as preferred survival companion, leader, and leader other than A/C.

3. The two items which follow both showed ambiguous and inconsistent trends toward association with the various pre- and post-training measures.

"On the trek, what man or men on the crew did the most hunting, fishing, or trapping? You may include yourself." (Referred to in this report as "hunted most.")

"On the trek, what man or men seemed almost at the breaking point?"

The last question seemed to be the least "useful" of the six post-training items, in that there was almost no indication of its having measurable relationship to any of the change measures.

SUMMARY AND CONCLUSIONS

Certain recurring and meaningful trends emerged from the statistical analysis of the data. In view of the exploratory nature of this investigation, the restricted size of the sample involved, and the preliminary form of the instruments used, these findings should be interpreted and generalized with caution. Nevertheless, a summary of the tentative conclusions drawn from them will serve both to bring the present project into clearer focus and to provide a basis for the planning of future research.

This section of the report, then, will summarize and discuss briefly what appeared to be the principal conclusions suggested by the findings.

1. The initial hypothesis stated that "gains and losses in the number of choices crew members receive as leaders (or as survival companions) are related to the frequency with which they also are selected as having manifested certain specific behavior during training." Application of the chi-

square technique as a test of independence yielded results which may be regarded as giving partial support to the hypothesis. A tally of the significant chi-squares provides a rough index of the extent to which the hypothesis was verified. Specifically, of a total of 60 values of chi-square (30 from each of the two classes), 23 were significant at the .01 level; 14 were significant at the .05 level; and 23 failed to meet either criterion of significance. Of a possible 30, there were 13 instances in which there was a consistent and significant trend in both classes. A more conclusive judgment as to the acceptance or rejection of the hypothesis must await further research with a larger sample of crews.

2. In general, significant values of chi-square were derived most frequently from discrepancies between observations and expectancy occurring in the category including those persons *who* gained in survival companion or leader status. There was little indication that those who lost status differed markedly from expectancy in the number of choices they received on the post-training criteria.

3. There was a consistent tendency for those who gained in status as survival companions or leaders to receive more than the expected number of post-training choices based upon criteria describing "positive" behavior, and fewer than the expected number of negativistic behavior choices. (The distinction between the two types of behavior was made in terms of a postulated constructive or disruptive contribution to the performance of group tasks.) This trend was reversed with respect to the one "rejecting" pre- and post-training measure, the "least preferred survival companion" item.

4. The post-training question as to "who griped most" was not associated with leader status, but was related in both classes to the choices received by those chosen as preferred or as least preferred survival companions. The implication is that further observation of crews in survival training might reveal other typical differences between individuals who are rejected or accepted as survival companions in contrast to those chosen as leaders. It might be, too, that what would be described by an outside observer as the same behavior would be perceived by the crew as "griping" if it were manifested by other crew members, but would not be so labelled if indulged in by recognized leaders.

5. The close correspondence between the significant trends found in the analysis of choices received as leader and as leader other than A/C, suggests that elimination of the A/C from consideration did not affect the relation between leader status and "perceived" behavior. Furthermore, the

results did not appear to be affected differentially by the fact that the former item specified that one choice was to be made, while the latter permitted unlimited choices exclusive of the A/C. It would seem, therefore, that the use of either question would be likely to elicit the same and as much information as the use of both.

6. There was almost no indication that status as enlisted leader depended upon any of the specified ways of behaving during survival training. Inasmuch as the crew members were expected to exclude all officers from consideration in making enlisted leader choices, they were required to respond to a situation with which they may have had no actual experience. It is possible, therefore, that this criterion may have had little meaning for them. In view of the emphasis which the Air Force places upon developing the leadership potentialities of the enlisted crew members, it would be important to know how well this objective is understood by the men and to establish the criteria upon which expressed choices of enlisted leaders are based.

7. In analyses involving responses to the question as to who seemed near the breaking point, the findings were almost entirely negative. This particular question required crew members to make a relatively refined clinical judgment *about* observed behavior, a judgment that they may have been both ill-equipped and reluctant to attempt. The question presupposes, as well, an extremely tension-producing situation, which assumption may have been unwarranted with respect to the training experiences of these two classes. But regardless of the validity of these conjectures about underlying factors, the data show that, at least as measured by these instruments, being perceived as being near the breaking point does not detract noticeably from a man's status as leader (or survival companion) within his crew.

8. As shown by the drop in the frequency of scorable responses to such questions, crew members seem to be noticeably resistant to expressing choices based upon obviously negatively toned criteria.

IMPLICATIONS FOR FURTHER RESEARCH

Finally, the conclusions reached in this study have implications for two aspects of subsequent research planning: first, for the revision of the instruments used or the design of new sociometric tests to be administered under similar conditions; and second, for the formation of new questions or hypotheses to be answered or tested in future studies.

With reference to the first problem, involving the design and use of this

type of sociometric instrument, the experience acquired in conducting the present study suggests that (1) the specific choice criteria should be derived from careful prior observation of the behavior to be "rated," (2) exceptional precaution should be taken in the wording of negatively toned items if optimal cooperation of the subjects is to be secured, and (3) the restriction of subjects to a single choice and the exclusion of self-choices simplifies statistical treatment of the data and does not seem to distort *group* trends.

The present study has further significance in suggesting a number of questions relevant to the complex problems of leader status and choice behavior within aircrews. For example, some of the questions raised pertain to (1) the extent to which changes in leader status during survival training are maintained when crews return to the flight situation, (2) the differences between the characteristics of those crew members preferred as survival companions and those chosen as leaders, (3) the possibility that other observable behavior *not* measured by the instruments used here may be significantly associated with leader or survival companion status, and (4) the degree to which behavior manifested under the conditions of survival training is related to later performance in the combat situation. Study I shows that the behavior of the aircraft commander in a survival situation may be used successfully as a predictor of the crew's combat effectiveness. Similar studies may be carried out to relate the behavior of the other crew members to the crew's combat effectiveness.

The principal significance of this exploratory investigation is that the tentative conclusions reached can be translated into the design of more refined instruments, the formulation of more crucial hypotheses, and the development of more precise methodology. Such continued research is essential in order to increase the present ability to predict the performance of aircrews in stress-inducing situations and, accordingly, to increase the efficiency of that performance.

AN APPROACH TO THE PREDICTION OF SOCIOMETRIC CHOICE¹

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What are the bases for a sociometric choice? Previous studies have attempted to answer this question by discovering significant correlations between the members of friendship pairs with different variables. Variables have included chronological age, socio-economic status, nearness of dwellings, test and inventory scores of intelligence, attitude, and personality (4).

The present study had three aims. First: to test the value of an elementary formulation of the factors involved in sociometric choice by prediction of actual choices. Second: to develop a more complete set of hypotheses and definitions of factors involved in sociometric choice from a study of failures in prediction. Third: to compare the value of several methods for the collection and analysis of data in the study of sociometric choice.

The initial formulation assumed that sociometric choices are a function of the choosing persons' perceptions of the demands of the situation for which choices are made, and the values represented by the available choice persons. Predictions of the group's actual choices were made from data corresponding to these perceptions. Several cases of unsuccessful prediction were used as bases for hypotheses about additional factors in the choice process.

In this study, a sociometric choice was viewed as the outcome of a process in which a person representing certain values is selected for a situation demanding those particular values. The chooser's perception of each of his available choices was called his *interpersonal percept*. This percept was composed of specific *interpersonal percept values*, i.e., characteristics which the chooser might expect of that person in one or more situations. Each of the three situations for which persons were chosen was called an *interaction setting*. This was described in terms of specific *interaction setting values*, i.e., values which the chooser perceived as "demanded" by each situation.

¹ This paper is based on a portion of a doctoral dissertation submitted in June, 1952, to the Department of Psychology at Northwestern University. I am indebted to Dr. Robert L. French for his invaluable suggestions and guidance in carrying out this study.

METHOD

Subjects were the entire group of 22 residents of a college fraternity house, ranging in age from 17 through 27 years, from freshmen to seniors. All had lived together in the fraternity house for at least three months, the modal period being one year. To initiate the study, the writer outlined for the group of prospective subjects what would be expected of them in this "study of factors important in group living." The group discussed these expectations, and then, on a secret ballot, voted unanimously to participate in the project.

Immediately following the unanimous acceptance of the project, a sociometric test was administered to the group. Each subject was asked to make choices and rejections from among the other 21 house residents for three interaction settings. They were further told that they could make as many or as few choices and rejections as they wished, but that they were to number choices and rejections in order of *intensity*. The following selections from the instructions describe the three interaction settings:

"*Imagine that a problem has arisen involving your fraternity and the University Board of Trustees. Your fraternity is to select one member to represent the interests of your fraternity in a meeting with a committee of the trustees.*"

"*Imagine that the XXX sorority is having a party for their new pledges. You have been invited by one of their actives and asked to bring a date along for her 'pledge daughter'.*"

"*Imagine that you are about to take off on a month-long camping trip. You wish to have a partner along and so you make a choice from the house men in your fraternity.*"

The results of this initial sociometric test were not inspected until the predictions of choice had been completed.

The next step was to obtain data from each person whose choices were to be predicted, in order to determine (a) his interaction setting values for the three settings, and (b) his interpersonal percept values for each of his available choice persons. Each of these two kinds of values was obtained by two different methods: a Guess-Who type questionnaire, and a Value-Analysis scheme, applied to interview and projective test data. Two independent sets of choice predictions were then made, one based on Guess-Who data, the other on Value-Analysis data.

In the four weeks after the sociometric test, the data used for pre-

diction were gathered in the following order. First, each subject in a single session with the writer completed a Setting-Picture Test and an Interpersonal Interview. These were data for Value-Analysis scheme. Then, in a final group meeting, all subjects completed the Guess-Who Test and the Interaction Values Checklist, also in that order. These were Guess-Who data.

Setting-Picture Test²

This test consisted of five cartoons, of which three represented in rough but lifelike fashion the situation and activities characteristic of the three interaction settings for which choices were asked. Two additional cartoons were interspersed among the first three in order to disguise the purpose of the test. Subjects were asked to make up a story for each of the pictures according to the usual instructions given for the Thematic Apperception Test. To insure that each story would show the values considered important by the subject for the interaction setting, each card was introduced by a brief description. These descriptions, in order of presentation, follow.

1. "In this scene a young man is being introduced to a young lady."
2. "This scene shows a representative of a fraternity meeting a committee of trustees about some problem."
3. "This scene is from a college campus." (The card showed a scholarly looking young man leaning against a tree looking at a baseball player.)
4. "This scene shows two men in their late teens or early twenties, and they are on a camping trip."
5. "This is a party scene. The two couples in the picture are out together for the evening."

The second, fourth and fifth pictures represented the settings for which choices were later predicted. The stories told to these three pictures were then analyzed for interaction setting values, using the Value-Analysis described below.

Interpersonal Interview

Subjects were given a list of the other persons in the group and asked to describe them, giving as full an account as possible of their thoughts and feelings regarding them. The interview was virtually self-directed,

² The five pictures in the Setting-Picture Test were drawn according to the writer's specifications by Mr. Seymour Rosofsky, to whom special indebtedness is expressed.

with only an occasional request from the interviewer for elaboration or illustration. Interviews were sound-recorded. Typescripts of the interviews were later analyzed, by means of the Value-Analysis scheme to be described.

*Value Analysis Scheme*³

This scheme was based on a revision of an earlier form derived from the categories of both White and Bales (6, 1). Below is a list of the categories, each of which was defined in detail. (See Table 1.)

TABLE 1
VALUE-ANALYSIS CATEGORIES

1. Appearance, pleasing	Appearance, not pleasing
2. Autonomy, gives	Autonomy, denies
3. Conformity	Conformity, lack of
4. Conscientious	Conscientious, not
5. Control, accepts	Control, rejects
6. Dependency, asks	Dependency, doesn't ask
7. Fair	Fair, not
8. Friendly	Friendly, not
9. Girls (3 degrees of dating frequency)	
10. Help, gives	Help, denies
11. Integrity	Integrity, lack of
12. Intelligent	Intelligent, not
13. Mature	Mature, not
14. Mood, positive or negative	
15. Original	Original, not
16. Participation	Participation, lack of
17. Poise	Poise, lacks
18. Popular	Popular, not
19. Recognition, gives	Recognition, denies
20. Respected	Respect, lack of
21. School, high	School, low
22. Social Distance (3 degrees)	
23. Status Threat, reaction to (3 alternative responses)	
24. Talks	Talk, doesn't

Intrascorer and interscorer reliability with this interview material

³ The Value-Analysis scheme included, in addition to values represented in the Guess-Who questionnaire, three degrees of *Social Distance*, three degrees of *Dating Activity*, and the categories of *Intelligent* and *Not Intelligent*.

ranged between 65-81 per cent of agreement and 48-59 per cent of agreement respectively. The formula used was:

Total number of scoring agreements	—	Per cent of agreement
Total number of different passages scored by two scorers, or same scorer at two times		

Guess-Who Test (5)

To determine the content of each subject's interpersonal percepts, 43 Guess-Who statements made up of 20 pairs of positive and negative values, and one response category with three alternatives were used. All of these statements corresponded to categories in the Value-Analysis scheme. Under each statement, the subject wrote in the names of those in his group with the particular quality or behavior described. A value word was later attached to each statement as a very brief designation.

Interaction Setting Value Checklist

A Guess-Who method was also used to obtain each person's interaction setting values for the three interaction settings. The 27 positive value statements were taken from the total list and presented in the form of a checklist with three columns in which subjects checked those characteristics important for each of the three settings.

Method of Choice Prediction

Predictions of each subject's choices were made by finding those other subjects whose interpersonal percept values corresponded most nearly to the choosing person's set of interaction setting values for each interaction setting. In making the choices, a grid was used on which the names of the interaction settings and available choice persons were shown at the left of the rows, while the names of the setting and percept values were entered at the top of the columns. Then each subject's interaction setting values for the three settings were entered along the rows at the top of the grid, and his interpersonal percept values for each of the other persons in the group were entered along the rows beneath. Predictions were made by using each of the three sets of interaction setting values at the top of the page as "selectors" to pick out those subjects below with the most nearly similar sets of interpersonal percept values. Since the numbers of actual sociometric choices made by subjects varied, predictions were made to correspond as closely as possible in number to each subject's actual choices for the three settings.

Following predictions, the statistical significance of the numbers of correctly predicted choices was determined for each person, for each interaction setting, and for each method. The following formula was used for determining the statistical significance of these predictions:

$$P = i = O \frac{\sum_{x=1}^{21} \frac{C_x}{n_r + 1} \cdot \frac{C_{21-x-r-i}}{21-x}}{21 \cdot x}$$

where x = number of choices predicted for one person for one interaction setting

where r = number of correct predictions

where n = number of actual choices by one person for one interaction setting

RESULTS

Prediction of Actual Choices

The statistical significance of the numbers of correctly predicted choices showed considerable variability in level of predictive accuracy from person to person, setting to setting, and one method to the other. Overall success in prediction, however, was beyond the .001 level of significance for both methods in all three settings.⁴

Some Additional Hypotheses Concerning Sociometric Choice

Despite the high level of overall success in prediction, there remained individual sets of predictions with many errors. In order to learn what factors had not been considered in the initial analysis, the patterns of choices and rejections given and received by three different persons were studied in detail against a background of interpersonal percept data from the givers and recipients of the choices and rejections.⁵ The three persons whose patterns of choices and rejections were selected represented three different levels of overall choice status, and are referred to in the following discussion as *High*, *Middle*, and *Low*.

1. Different choices by one person for the same setting may be based on differing salient values in a set of values, all of which are important for a particular setting. Thus, it is incorrect to assume that a particular interaction setting will make a single specific demand or set of

⁴ The combined probability values for the number of correct predictions for each setting by each method were obtained with Fisher's formula (2, pp. 99-101).

⁵ The number and variety of data employed in this configurational analysis made it infeasible to employ this method on a larger scale in the present study.

TABLE 2

STATISTICAL LEVELS OF SIGNIFICANCE FOR NUMBERS OF CHOICES CORRECTLY PREDICTED FROM GUESS-WHO (GW) AND VALUE ANALYSIS (VA) DATA

Choosing Persons	Interaction Setting					
	Fraternity Representative		Double Date		Camping Partner	
	GW	VA	GW	VA	GW	VA
AND	.3381	.7519	.1268	.0173	.0630	.0040
BAS	.0055	.0307	.1268	.1401	.0008	.0805
BEIM	.6023	.0008	.2990	.4781	.4281	.1268
BRED	.0635	.5900	.3865	.0414	.0630	.2281
COL	1.0000	.4887	.0115	.3524	1.0000	.5376
DV	.6023	.0115	.0630	.0630	.4887	.6959
FLO	.0414	.1428	.3865	1.0000	.3381	.1278
GAG	.3865	.3865	.6023	1.0000	.0414	.3865
COM	.0414	.0797	.0414	.0008	.3865	.0414
COR	.0630	.3381	.0112	.0375	.0055	.0114
HOU	.3865	.4887	.0414	.4887	.0414	1.0000
KEH	.0114	.5789	.0414	.0797	1.0000	.5789
KNA	.0414	.0030	.0900	.3359	.3865	.1278
KNO	.0630	1.0000	1.0000	1.0000	.2835	.5865
LOR	1.0000	.0115	.6023	.6023	.5757	.0114
MIC	.0307	.0316	.0112	.9625	.4721	.3235
NEW	.0115	.1479	.6023	.1479	.3381	.0276
SIL	.3381	.0630	.1268	.0642	.0563	.0426
SAR	.0112	.3091	.0630	.3381	.1268	.0010
STRA	.6023	.6023	.3381	.0630	.0115	.4887
SIN	.0008	.3865	.1479	.8805	.1479	.6023
TOM	.0115	.1479	.3865	1.0000	.3865	.0075
Chi-squares:	111.56**	99.15**	95.92**	75.50**	84.70**	103.37**

**Significant at the .001 level of confidence, with d.f. = 44.

demands for which only a very specific kind of person is suitable as a choice. What the setting appears to do is limit the range within which different kinds of persons may be chosen. Within this range, however, persons with quite different salient characteristics may be chosen, because each of their salient characteristics corresponds to one of the values important for the chooser in the choice situation.

2. Interpersonal choice tends to be confined to those out of the entire group with which the chooser has had experience related to that anticipated for the interaction setting. Some persons whose interpersonal percepts fitted them for particular interaction settings were not chosen

because the chooser had not been acquainted with them in the type of situation for which choices were made. Thus, an open admirer of *Middle* failed to reciprocate *Middle's* choice of him for the camping trip. In his interview he remarked, "I've never doubledated with him, never had the chance. Our association together has been more or less around the house and through school and that, and going out to eat once in a while." It is reasonable to expect that appraisals of the other person's value for a particular setting which are based on direct and repeated experiences with the other in that setting will be used with greater confidence in making choices than will appraisals of value derived from more indirect or occasional experiences related to the interaction setting.

3. Choice may be limited by the availability of the other person for actual association. Thus, analysis of the choices of *Low* for the camping trip showed that his first and reciprocal choice was another "low" person to whom he had attributed a number of negative values. The evidence in this and other cases suggested that one "low" person had chosen another "low" person, and vice versa, because of their availability to one another for association. This "availability" factor may impose definite limits on the simple "functional" formulation with which this study began. As long as one is concerned only with the conditions that enable the relationship to endure, this factor may not be of very great importance. However, "availability" would seem to be of considerable importance for the early stages of particular relationships. The importance of this factor for the choice-defined relationships of this study may be seen when one considers that many of the choices made represented just such early steps in interpersonal relationships.

4. For those situations in which contact with one's choice is more intimate, like the camping trip, the most important value may be the other's acceptance of one's self. This was suggested by the finding of a statistically significant increase in the numbers of mutual choices from the fraternity representative setting to the double date and camping partner settings. This agrees with Jennings' finding of a greater number of mutual choices for situations involving a more personal kind of relationship (3). In a study of individual choice and rejection patterns, it was observed that all three camping partner choices made by *Middle* had ascribed positive qualities to him. On the other hand, all those whom he rejected for this setting had ascribed negative values to him. Here the expected response of the other person to oneself appears related to one's own choice or rejection of him. This value placed on the other's accept-

ance of self suggests the addition of items dealing with "other's acceptance of self" to the Guess-Who Test. This particular value appears to have been represented by the value of *Social Distance* in the Value-Analysis scheme. It was found that attributions of minimal *Social Distance* to other persons in the Interpersonal Interview enabled accurate predictions of choice for the camping trip setting, and, to a lesser degree, for the double date setting. This, with the previous finding mentioned above, points to a connection between intimacy characteristic for an interaction setting, reciprocity of choice, and minimal social distance.

5. Rejection by a high status person is related to perceptions of him that deviate in a negative direction from the group perceptual norms. Thus, *High*, who rejected three persons for the camping trip, received from them six out of the eight negative judgments in a total of 242 judgments directed toward him. It is hypothesized that one's expectation of the other's acceptance or rejection of one's self may affect not only one's choice, but also one's perception of the other's characteristics.

6. Choice for more intimate interaction settings appears to have been influenced by considerations of similarity between one's self and one's choice. Thus *Low's* reciprocating first choice for the camping trip setting remarks of *Low*: "We have sort of the same interests." And *Low* says "... him and me, I guess, were one of the last pledges and so forth ... he's a friend that if you need your shoes polished, he'll polish them and things like that he wouldn't have to do if he weren't your closest friend." The factor of perceived similarity in interests of group position in connection with intimate relationship choices suggests that a more complete analysis of choice at the perceptual level might well be extended to take into account the part played by self-perceptions in the choice process.

7. The positive or negative responses or attitudes of possible choice persons toward the choosing subject appear to have affected some choices without appearing in either the Guess-Who or Value-Analysis material. Such inability or unwillingness to express relevant attitudes or responses contributed to the difficulty involved in making correct choice predictions.

Comparison of Methods

Consideration of the number of levels of significance less than .05 for the choices correctly predicted suggests that the Guess-Who method was superior to the Value-Analysis method for the fraternity representative and double date settings, but that the Value-Analysis method was

somewhat more accurate for the camping partner setting.⁶ Closer analysis of the data reveals that the Value-Analysis method was of greater accuracy for the camping partner choices because of the high predictive power of the value *Minimal Social Distance*. When, in addition, the expenditure of time and energy required for the two methods is considered, the Guess-Who method is clearly superior for use in a study like the present one.

DISCUSSION

The findings presented above enable us to reconsider the initial "functional" formulation of the choice process in terms of demand and supply factors. From the success of predictions made on the basis of the original two-factor analysis, it is evident that these two factors were of considerable importance. Yet the hypotheses derived from an examination of data in three cases of relatively unsuccessful prediction suggests the importance of the following unconsidered factors:

1. The kind and extent of the subject's past experience with and knowledge of persons theoretically available for choice. Here the connection can be seen with the influence of propinquity and habitual association on the formation of relationships in everyday life. It is not possible for persons to ignore actual past experiences in making choices even when specifically given an opportunity to make "free" ones. In addition to the factors of suitability and availability from past experience and knowledge, the influence of the subject's expectations of his potential choices' amiability toward him appears to be important, especially for the more intimate situations.

2. The subject's perception of himself, especially when making choices for the more intimate settings. Thus, extent of correspondence between setting and percept values must be supplemented by consideration of the degree of similarity between self and other percepts, when predicting choices for more intimate settings.

In summary, then, it is hypothesized that in addition to the values of interaction setting and interpersonal percept, sociometric choice is affected by the following factors: suitability, availability, and amiability of potential choice persons, and the relation between perceptions of self and potential choice persons. Further research is desirable to determine the importance of these and other factors in various kinds of interpersonal choice situations.

⁶ See Table 2, italics for figures below .05.

SUMMARY

The present study aimed at a clarification of the factors affecting sociometric choice.

Subjects were 22 house residents of a college fraternity who made undisclosed choices of persons for fraternity representative, double date partner, and camping partner.

At the outset, it was hypothesized that sociometric choice is a function of the degree of fit between the demands of a situation for which a choice is made, and the values represented by the perceived characteristics of a potential choice person. Data corresponding to these "demand" and "supply" factors were gathered by means of two parallel methods: one based on a Guess-Who questionnaire, the other on a Value-Analysis of interview and projective material. Two sets of predictions of choices were made from these data and later compared with the actual choices.

Findings were:

1. Success in prediction of sociometric choice was statistically significant for both sets of predictions and all three settings at the .001 level of significance.

2. An intensive analysis of three patterns of choice relationships, based on interviews, Value-Analysis, and Guess-Who data, suggests that the following additional factors are involved in the process of sociometric choice: experienced suitability, social availability, and personal amiability of potential choice persons. Similarity between perceptions of self and potential choice persons appears to be important in making choices for the more intimate settings.

3. The Guess-Who approach proved superior to the Value-Analysis approach in the present study. The former provided a clearer, more complete set of data, plus better predictions, with much less expenditure of time and effort.

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INTERESTS, LEADERSHIP AND SOCIOMETRIC STATUS AMONG ADOLESCENTS¹

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A. INTRODUCTORY

A previous article has discussed the relationship between leadership and interests. The present article is an attempt to relate inventoried interests to social acceptability, being chosen by one's peers as a friend.

Most of the studies dealing with sociometrically measured acceptability have, like Jennings (8), distinguished between the social behaviors of highly chosen and underchosen subjects. Some studies have used variations of the "Guess Who?" technique described by Tryon (16) to find what types of peer-judged behavior are related to the number of friendship votes a subject receives from these peers. Since ratings by the same judges are used for both independent and dependent variables, some halo effect can be expected. It is not surprising that Kuhlen and Lee (10), Bonney (2), and Tuddenham (17), in studies of this type, all find close relationships between acceptability and other positively judged traits. Attempts to link acceptability with independently measured psychological traits of some generality have had mixed results. Nowell (14) was unable to find any relationship between acceptability and test measures of adjustment among fifth grade children. Young and Cooper (19), however, found positive relationships, and Northway and Wigdor (13) have reported significant differences in Rorschach patterns between sociometric highs and lows, suggesting differences in characteristic personality patterns.

Another approach to this problem is through the use of interest measures; since interests are related to both personological variables and those of social interaction, they might be expected to show relationships with social acceptability.

¹ The research on which this present paper is based was part of a larger study completed in partial satisfaction of the requirements for the degree of doctor of philosophy in Psychology at the University of California and is a continuation of a series of sociometric and interest studies in the Department of Psychology and the Institute of Child Welfare, University of California. The author wishes to thank Professors Read D. Tuddenham and Harold E. Jones for their valuable criticism and suggestions.

B. PROCEDURES

The present study examines the relationship of interests to acceptability by contrasting those who are highly acceptable as friends with those who are not acceptable to their peers. The subjects were chosen from the 730 students in grades eight through twelve of a California Bay Area public high school, to whom an interest test and a sociometric questionnaire were administered. This is the only high school in the community and the testing covered almost all of the 850 students enrolled.

The sociometric test included an item: "Who are your best friends here at school?" Votes given on this item to individual subjects were summed to constitute an "acceptability" score. It was not desired to put either a floor or a ceiling on the number of persons whom the subjects could name under this item, but, in order to avoid a disproportionate influence being given to the prolific namers of friends, only the first five names were counted in computing the acceptability scores. This is in agreement with Newstetter, Feldstein, and Newcomb (11) who found that extending friendship choices beyond five did not appreciably increase the investigators' knowledge of the sociometric structure being studied.

Sixty-eight boys were found who received no "Best Friend" votes. Only 25 girls received no votes under this item, so they were combined with the 58 girls who received only one "Best Friend" vote. (Newcomers to the school were excluded from the lists.) These were the "Unacceptable" groups. Each of these "unacceptable" subjects was then matched with another subject of the same sex and in the same grade who was among those receiving the most votes. All of these latter had been chosen by three or more of their peers. These were the "Acceptable" groups. In all, 136 boys and 166 girls were in the contrasted groups.

Acceptable boys and girls (the sociometric "stars") were contrasted with unacceptable (the "isolates") in terms of scores derived from an interest test. This test was developed from the Interest Record described by Mary C. Jones (9). It consisted of 200 items arranged as "Places to Go", "Things to Do", "Vocations", "Things to Talk About", and "Magazines to Read". The possible responses were: "Like", "Indifferent", or "Dislike". The scores included:

- (1) Response tendency scores of the number of items answered in one of the three fashions.

- (2) An empirically derived score of maturity which measured the extent to which the individual subjects' responses were similar to those of

the older subjects in contrast to the younger and an empirically derived non-conformity score which measured the extent to which the subject gave responses given by few of his own sex in his own grade.

(3) Content scores derived from agreement of judges as to what items were expressive of social, heterosexual, sports, spectator, adventure, mechanical-constructive, intellectual-cultural, scientific, and adult-disapproved ("delinquent") interests. Since the scoreable responses on the content scales were all in the "Like" direction, raw content scores were divided by the individual's Like score and multiplied by 100 before comparisons were made.

There were other reputation items on the sociometric test, but the acceptable and unacceptable groups were not compared in scores on these items since they would be quite susceptible to halo effects. The two groups were, however, compared in terms of their sociometric behavior, the number of votes which they gave on several of the items. The votes given on the "Best Friend" item was called the Acceptance score, the votes given on an item "Name any students you know that you would not particularly care to be friendly with," was called the "Time Rejecting" score, while the number of votes given on an item, "Name any students you know that you would like to be more friendly with" was called the Attracted score.

Comparisons were made straightforwardly between the two contrasting groups for all scores except maturity and non-conformity. These two variables were correlated with acceptability on a group of 709 subjects who satisfactorily completed the interest test, and who were not newcomers to the school.

C. RESULTS

The results of the comparisons between acceptable and unacceptable groups are shown in Table 1. The differences between the girls' groups are the most striking. The acceptable girls have social, heterosexual, and "delinquent" interest scores significantly higher than those of the unacceptable, while their Dislike and intellectual-cultural scores are significantly lower. In their sociometric behavior, the unacceptable girls choose significantly fewer persons as best friends, and the 25 completely unchosen girls reject significantly fewer persons than do the acceptable girls.

There are two significant differences in variability between the scores of the girls' groups. The unacceptable girls have a wider (C.R. = 3.27) variability of spectator scores, while on adult-disapproved interests of the "delinquent" scale, where they tend to have uniformly low scores, their variability is less (C.R. = 3.63) than that of the acceptable group.

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TABLE 1
COMPARISON OF MEAN SCORES OF "STARS" AND ISOLATES AS DIFFERENTIATED BY
ACCEPTABILITY SCORES

Variable	Girls' Means			Boys' Means		
	Stars	Isolates	Critical Ratio	Stars	Isolates	Critical Ratio
Like	86.349	81.675	1.33	87.603	86.735	.20
Indifferent	54.241	47.867	1.95	56.382	60.515	-1.05
Dislike	59.157	69.542	-2.70*	55.426	52.706	.65
Heterosexual	9.892	8.024	3.23	7.838	7.015	1.24
Spectator	14.867	15.145	-.49	14.676	14.750	-.12
Sports	11.663	10.807	1.77	14.853	13.956	1.18
Mechanical-						
Constructive	6.807	7.373	-1.04	13.618	15.500	-2.60
Science	3.759	4.590	-1.77	6.485	6.588	-.13
Social	28.301	25.964	3.08	23.735	22.456	1.50
Adventure	10.313	10.410	-.17	14.309	14.529	-.34
Delinquent	4.482	3.289	3.55	7.735	6.485	1.87
Intellectual-						
Cultural	12.795	15.880	-3.86	8.397	9.191	-0.90
Acceptance	5.250	3.521	4.36	4.889	3.756	1.95
Times						
rejecting	1.316	.972	1.74	.746	.756	-.05
Attracted	1.584	1.521	.46	1.381	1.156	.58

* A negative Critical Ratio indicates that the isolates' mean score is larger than that of the stars.

Among the boys there is one significant difference, the lower scores of the acceptable on the mechanical-constructive scale, and all the significant differences of the girls' groups reappear as statistically non-significant tendencies in the same direction. The acceptable group tends to dislike fewer items than the unacceptable and to have higher social, heterosexual, and "delinquent" interest scores. Sociometrically they follow the lead of the girls in tending to name more persons as friends, a tendency which very nearly ($C.R. = 1.95$) reaches statistical significance.

The unacceptable boys show greater variability in social interests ($C.R. = 2.04$) and in the attracted score ($C.R. = 2.68$) than do the acceptable group.

In Table 2 is shown the relationship between the acceptability scores of the subjects and their maturity and non-conformity scores from the Interest Record. Scores for all grades have been combined. The maturity scores,

TABLE 2
MEAN ACCEPTABILITY SCORES OF SUBJECTS CLASSIFIED ACCORDING TO INTEREST MATURITY
AND NON-CONFORMITY SCORES¹

Maturity					Non-Conformity				
Boys			Girls		Boys			Girls	
Score	No.	Mean Accept.	No.	Mean Accept.	Score	No.	Mean Accept.	No.	Mean Accept.
—9.5 to —7.6	9	3.67	3	4.67	1	5	6.20	0	0
—7.5 to —5.6	11	5.00	24	4.71	2	45	5.04	33	4.91
—5.5 to —3.6	48	4.71	39	4.93	3	16	5.31	28	5.14
—3.5 to —1.6	64	4.53	53	5.33	4	84	5.58	87	5.00
—1.5 to +0.4	67	5.07	60	5.01	5	74	5.24	67	4.96
0.5 to 2.4	66	5.67	69	5.09	6	66	4.59	53	4.91
2.5 to 4.4	51	5.15	43	4.77	7	37	4.54	38	5.42
4.5 to 6.4	21	5.00	33	4.87	8	23	4.87	22	4.63
6.5 to 8.4	19	5.36	11	5.09	9	11	3.36	9	5.44
8.5 to 10.4	9	4.78	8	4.63	10	6	3.33	5	5.20
Total	365	5.02	343	5.01		367	5.01	342	5.02
r		.096		— .035			— .211*		.050
Eta		.221*		.105			.286		.093

¹ Raw acceptability and non-conformity scores from the ten sex-grade groups have been converted to scores on a ten-point scale whose mean = 5 and whose standard deviation = 2 before being combined. Maturity scores are shown in terms of absolute deviations from the grade means.

* Significant at .05 level.

which were approximately normally distributed in each grade and had similar standard deviations, (the range of the ten sex-grade groups' sigmas was from 3.80 to 4.31) were combined in terms of absolute deviations from the grade means. The distributions of acceptability and non-conformity scores from the ten sex-grade groups were neither normal nor of equivalent variability. Consequently, the individual scores have been transmuted to scores on a ten-point scale where the mean is five and the standard deviation is two before being combined.

It will be seen that acceptability is unrelated to these measures of maturity and non-conformity among the girls. Among the boys, the relationships are significant but slight. Non-conformity and acceptability seem to show an inverse linear relationship (the eta, though significant, does not significantly differ from r). Interest maturity and acceptability may show a curvilinear relationship but although eta here is significant at the .05

level, the probability of the observed difference between η and r occurring purely by chance is between .05 and .10. It had been predicted that a group which led the grade mean in maturity scores would be the most acceptable, and the peak in acceptability scores for the boys' group who are, on the average, 1.5 points above their grade mean suggests that the hypothesis should not be rejected. However, the specific prediction had been made that the group which is one sigma above the maturity mean (the +3.5 deviation group) would be significantly more acceptable than the group at the mean and this prediction is not confirmed.

D. DISCUSSION

The acceptable girls are characterized by sociability as reflected in social and heterosexual interest scores which significantly exceed those of the unacceptable. The "star" is more involved with people, both in accepting and in rejecting, than is the isolate, but in dealing with things, (as indicated by the mechanical and scientific interest scores) the acceptable girl tends to lag behind the isolate. The outgoing, even impulsive, characteristics of the acceptable girl are shown in her significantly smaller Dislike score, the higher Like score, and the higher sports and "delinquent" scores. It would seem that she has some sort of easy-going flexibility about her impulses; she does not stick so closely as the isolate does to the negative feminine stereotype. Instead of rejecting many activities, she tends to be indifferent about them. This does not mean that she is not feminine. In most of the interest differences it would seem that the acceptable girls fall on the more feminine side. But theirs is apparently a kind of positive femininity in contrast with what seems like a negative rejection of the masculine on the part of the isolate girls. The impulsivity of the star must be distinguished from the sort of defiance of peer norms which is measured by the non-conformity scales. It will be recalled that there was no relationship between social acceptability and non-conformity among the girls. The socially successful girls are neither more nor less conforming than the isolates. But within the bounds of conformity to peer norms it would seem that the acceptable girl allows herself more leeway than does the unacceptable one.

The acceptable boy, like his girl counterpart, shows his sociability in his social and heterosexual interest scores and in his tendency to accept more people as friends than the unacceptable boy. His higher sports score agrees with Bower's finding (3) of a positive correlation of popularity with strength

and physical ability among adolescent boys. It may be interpreted, together with the more adult-disapproved interests of the acceptable group, as showing among the acceptable boys something of the acceptable girl's tendency to carry impulses into action. This is in agreement with Frankel's (6) finding that sociometric stars among younger children clash more frequently with adult rules than do the isolates, and it accords with Bonney's (2) statement that socially accepted children are generally seen as more active and daring. The stars seem to be "externalizers" while the isolates seem to contain their impulsivity by maintaining some kind of internalized control. Northway and Wigdon's (13) study of the Rorschach patterns of sociometrically distinguished groups of children can be interpreted as showing the same difference in sensitivity and responsiveness to outside stimulation.

The significantly higher intellectual-cultural interests of the unacceptable girls and the significantly higher mechanical-constructive interests of the unacceptable boys raise some interesting questions. Are these interests isolating in themselves or are they, perhaps, a substitute for social success, what Fuller (7) calls a "compensatory interest"? Actually, they are probably circular in their efforts, a cause of isolation and a substitute for social success. "The students here have no other interests besides jam sessions. I like opera, ballet, and art," complained one girl who achieved an interest maturity score which was over two standard deviations above the mean of her grade. It is difficult to say whether her relatively low acceptability score (1) was the cause of her maturity and intellectuality or its consequence.

It is the same with the mechanical-constructive interests among the unacceptable boys. The significance of this relationship becomes even more striking when the relationship between mechanical interests and masculinity (Terman and Miles, 15) is recalled. Masculinity is a prized characteristic among these boys, but, in spite of the enhanced masculinity which goes along with the "tinkering" interests represented in this mechanical scale, high scores seem to be associated with social isolation. It may be that the patience which is needed for these constructive pursuits is related to the factor of perseveration which Cattell (5) finds inversely related to popularity. These findings correspond with those of Berdie (1) and Tyler (18) that engineering interests on the Strong are associated with poor adult social adjustment, apparently just another expression of the things-persons dichotomy which seems to run through the interests and social interactions of both young people and adults. Carter and Jones (4) have shown that

adolescent interest patterns can be interpreted in vocational counselling analogously to their interpretation among adults. From these results it may be said that, at least for this category of mechanical interests, personological predictions may be made from the interests of adolescents in much the same way that they are made from those of adults.

It would seem that there is more than one type of isolate, or, perhaps, more than one way of reacting to the fact of isolation. The unacceptable boys have significantly greater variability of social interests than the acceptable group while the unacceptable children of both sexes tend to have greater variability of acceptance scores. Apparently some isolates accept their status and make little attempt to reach others. These may correspond to the "recessives" whom Northway (12) describes. Others, corresponding in some ways to Northway's "aggressives", tend, perhaps unrealistically, to indicate interest in many social activities and to name a relatively large number of persons as their "best friends". There is a statistically non-significant tendency among the unacceptable of both sexes toward higher variability of intellectual interests which suggests that some, the aggressive perhaps, may be unchosen because of their lack of cultural polish, while others may find that absorbing intellectual interests make isolation unimportant. "I am not a friendly person," writes one isolated boy, whose intellectual interest score is in the top five per cent. "Anyone who can help me or the things that I strive for, I would like to become my friend." This boy, who has recently taken to spelling his Americanized surname in the original German manner, illustrates how an isolate can through intellectuality identify with another idealized group of persons and achieve detachment from the immediate group which fails to choose him. Among boys intellectuality is apparently a socially neutral variable. The present investigation shows it unrelated to general acceptability and a separate analysis of data from this sample shows that it is not operative in determining membership in or exclusion from a social clique.

The varying relationship of acceptability to non-conformity of interests among boys and girls deserves comment. It should be remembered that this nonconformity score represents deviation from the norms of the immediate peer group; persons with high non-conformity scores may actually be conforming to the norms of some other special group, e.g., the Seventh Day Adventists or the avant garde. For the boys there is a small but significant negative correlation between nonconformity and acceptability,² ap-

² The actual relationship may be a good bit closer than this correlation suggests

parently representing a trend in the boys' social perceptions to reject those who flout peer norms. With the girls, there is no such relationship; nonconformity is unrelated to acceptability. Tentatively it may be suggested that this is because adolescent girls judge their peers by two sets of standards, the first of docile "feminine" conformity, the second of colorful, stylish nonconformity. Acceptance may be won by both routes; there are friends for the conformists and friends for the nonconformists. It may be that what appears here is the feminine stereotype in transition in relation both to secular trends in American culture and to the age of the girl subjects.

E. SUMMARY

Seven hundred and thirty students in grades from eight through twelve were given an interest test and a sociometric questionnaire. "Unacceptable" subjects who were chosen by few or none of their peers were contrasted with "acceptable" subjects (matched by grade and sex) who were chosen by many as friends. In these criterion groups 302 subjects were included. The following significant differences were found: Acceptable girls show more social, heterosexual, and adult-disapproved interests; they dislike fewer interest items and have fewer intellectual-cultural interests; they accept more persons as friends even though they also tend to reject more than do the unacceptable.

✓ Acceptable boys show significantly fewer mechanical-constructive interests than do the unacceptable. For the entire test group acceptability has a small but significant negative correlation with interest non-conformity and a curvilinear relationship with interest maturity among the boys. Among the girls there are no such relationships.

In general the acceptable adolescent is seen as sociable, involved with people, and relatively impulsive. It is suggested that mechanical interests for the boys and intellectual interests for the girls may act both to isolate and to compensate for isolation.

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"RATIONAL ARGUMENT" AND "PRESTIGE-SUGGESTION" AS FACTORS INFLUENCING JUDGMENT¹

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The purpose of this study was to contrast the relative influence of four different sets of conditions in attempting to induce changes in judgment. The judgments involved the relative merits of ambiguous art stimuli.

The stimuli consisted of four abstract finger paintings, designated respectively A, B, C, D. The paintings had previously been judged of approximately equal merit by judges similar to the persons serving as subjects here.

The subjects were drawn from introductory psychology classes taught by the author. None were art majors, none had received special training in art and none admitted to any unusual interest in the art area.

Each subject ranked the four paintings in order of artistic merit twice: once upon first exposure to the paintings and once after having been subjected to one of the four experimental conditions to be described. The time interval between the two rankings was approximately one week. The aim of the varied experimental conditions was to contrast what the experimenter defined as "prestige-suggestion" with what he designated as "rational argument."

The subjects were drawn from several classes and the various phases of the experiment were conducted in different semesters. In each class after four weeks a sociogram was constructed. The students were told that they were going to be asked to participate in some research that involved meeting together in small groups. They were each asked to indicate those persons in the class with whom they would like to work in such research. These sociograms were used in the formation of the groups described below.

The four experimental conditions will be described separately, together with the results for each phase.

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² The author wishes to acknowledge his indebtedness to Professor Constance Perkins, Department of Art, Occidental College, Dr. Gordon Allport, Department of Social Relations, Harvard University, and Dr. F. T. Perkins, Department of Psychology, Claremont Graduate School, for their assistance and advice in the development of this study.

PART I: PROCEDURE AND RESULTS

In Part I, stars were selected from the sociogram and placed in small groups with persons who had selected them. Previous to this grouping the four finger paintings were ranked by each participant and the groups were so constructed that the star differed from all of the other members of the group with respect to the painting ranked highest. There was no uniform agreement among the other members of the group. The groups were placed in separate rooms with duplicate copies of the four paintings and asked to discuss their relative merits. After a thirty minute discussion the students returned to the classroom and re-ranked the paintings without further discussion.

Although student observers in the groups reported that the stars assumed leadership in the discussions, the stars were ineffective in influencing the measured judgments of the paintings. The re-rankings showed only 14 per cent of the subjects moved the painting preferred by the star to a higher ranking. This change is not statistically significant.

PART II: PROCEDURE AND RESULTS

Part II was similar in structure to Part I except that prior to the conducting of the discussion groups the stars were taken aside, informed of the nature of the experiment and provided with pseudo rational arguments to be used in discussion, in support of their position. These arguments made use of art design terminology and concepts and were designed to lend an air of rational argument to the presentation of the discussion leaders.

In contrast to Part I, the peer leaders were now decidedly effective. Seventy per cent of the subjects changed their rankings in the direction encouraged by the leaders. The results are in part a function of the particular painting supported by the leader, but the overall significance of the differences obtained exceeded the .01 level of confidence.

Comparing Parts I and II, leaders in peer groups were ineffective in inducing changes in judgment unless they were able to support their position with pseudo rational arguments provided by the experimenter. In the latter instance they were highly effective.

The aim of Parts III and IV was to introduce a factor of "prestige-suggestion" in the form of the judgments of a recognized art authority in order to contrast the results with those cited above.

PART III: PROCEDURE AND RESULTS

In this phase, two groups were drawn from the class. These groups were matched in size, proportions of men and women, the number of sociometric stars, isolates and cliques and also with respect to their previous rankings of the four paintings. Each group then met with a well known professor from the art department, who led a thirty minute discussion concerning the four paintings. In the process of this discussion she made her opinion relative to the finger paintings very clear, selecting one painting and indicating its superiority with many of the pseudo rational arguments described above. She selected a different painting to defend with each group.

The influence of the leader was again in part a function of the particular painting selected. In general however, the judgments of the art professor under these conditions were extremely effective. The overall differences in re-rankings, marking a shift to the position supported by the art professor were significant at beyond the .01 level. The amount of shift however was not greater than the shifts following the sessions in which peer leaders made use of "rational argument." As in that phase, here also seventy per cent of the subjects made shifts in the direction encouraged by the leader.

PART IV: PROCEDURE AND RESULTS

Two groups were again formed, as in Part III. In this phase however, the present experimenter led the groups in discussions of the finger paintings. During the last ten minutes of these discussions, he introduced into the discussion what he reported as being the opinion of the art professor described above. He merely indicated which of the paintings she had stated was best, although this information was presented firmly, repeatedly, and with the attitude that this constituted a significant judgment. No attempt was made however to offer any justification for her position. The experimenter attempted to assume the attitude that no justification was in order. As before, a different painting was selected with each group.

Only twenty per cent of the subjects shifted their re-rankings in the direction encouraged by the judgment of the art professor. These shifts were not statistically significant.

Tables 1 and 2 summarize the findings for each phase of the experiment. If one contrasts the results of the various phases, it emerges that

TABLE 1
RESULTS IN TERMS OF SHIFT IN MEAN RANK ASSIGNED "PREFERRED" PAINTING

Conditions	N	Mean rank prior to discussion	Mean rank following discussion	t
Peers without arguments	28	2.47	2.39	.31
Peers with arguments:				
Advocating "A"	17	3.12	1.59	5.00
Advocating "B"	10	3.30	2.80	1.19
Composite	27	3.18	2.04	4.52
Art authority with arguments:				
Advocating "A"	18	2.33	1.44	3.49
Advocating "D"	22	2.91	1.91	2.95
Composite	40	2.65	1.70	4.89
Art authority without arguments:				
Advocating "A"	25	3.16	2.76	1.62
Advocating "B"	35	3.20	3.26	.16
Composite	60	3.18	3.05	.87

NOTE: Each peer led discussion group consisted of four or five students. For purposes of brevity all subjects participating under similar conditions have been lumped together here and in Table 2.

TABLE 2
RESULTS IN TERMS OF PERCENTAGE OF SUBJECTS SHIFTING TOWARD VIEW SUPPORTED
BY DISCUSSION LEADER

Conditions	Percentage shifting toward leader opinion	t of percentage difference
Peers without arguments	14	
Peers with arguments	70	5.09
Art authority with arguments	70	
Art authority without arguments	20	5.68
Peers with arguments	70	
Art authority with arguments	70	0
Peers without arguments	14	
Art authority without arguments	20	.72
Peers with arguments	70	
Art authority without arguments	20	4.90
Peers without arguments	14	
Art authority with arguments	70	5.74

conditions which allowed the leader to defend his position with "rational arguments" resulted in highly significant changes in the subsequent re-rankings. When such "rational arguments" were not used, the discussion periods did not prove effective in inducing significant changes in later re-rankings. This was true even when the opinion of an authority was clearly made evident. What has traditionally been referred to as "prestige-suggestion" did not prove effective in these experiments.

DISCUSSION

Typical "prestige-suggestion" experiments in the past have seldom afforded opportunity for the authority figure involved to defend his position. It is hypothesized that the present results suggest that the positive influence of "prestige-suggestion" reported in many previous experiments may have been in part a result of an implicit assumption on the part of the subjects that were the opportunity present for the authority to justify his position, he could do so to their satisfaction. In the present experiment, when no justification followed, the influence was negligible. These findings are compatible with the position taken by Asch (1, 2), that in many "prestige-suggestion" experiments the subjects find themselves in ambiguous situations, requiring response. In making use of the limited cues available to them, they fall into the trap of being influenced by what is termed "prestige-suggestion." In the present experiment the subjects have responded by an intelligent use of the available cues. It is suggested that further study of the role of rational processes in reaching decisions may be in order.

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THE RELATIONSHIP OF SELECTED FACTORS TO THE SOCIAL STRUCTURE OF A STABLE GROUP

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The present study was undertaken to study the choice structure of a relatively stable group of college students. The term *stable* refers here to the fact that the group was not affected by newcomers or by drop-outs. The group was composed of 42 girls taking a college course of study which kept them together in *all* classes and activities. As such, the group was not subject to many of the changes in environment which characterize much of college life.

This study seeks to answer the following questions about such a group:

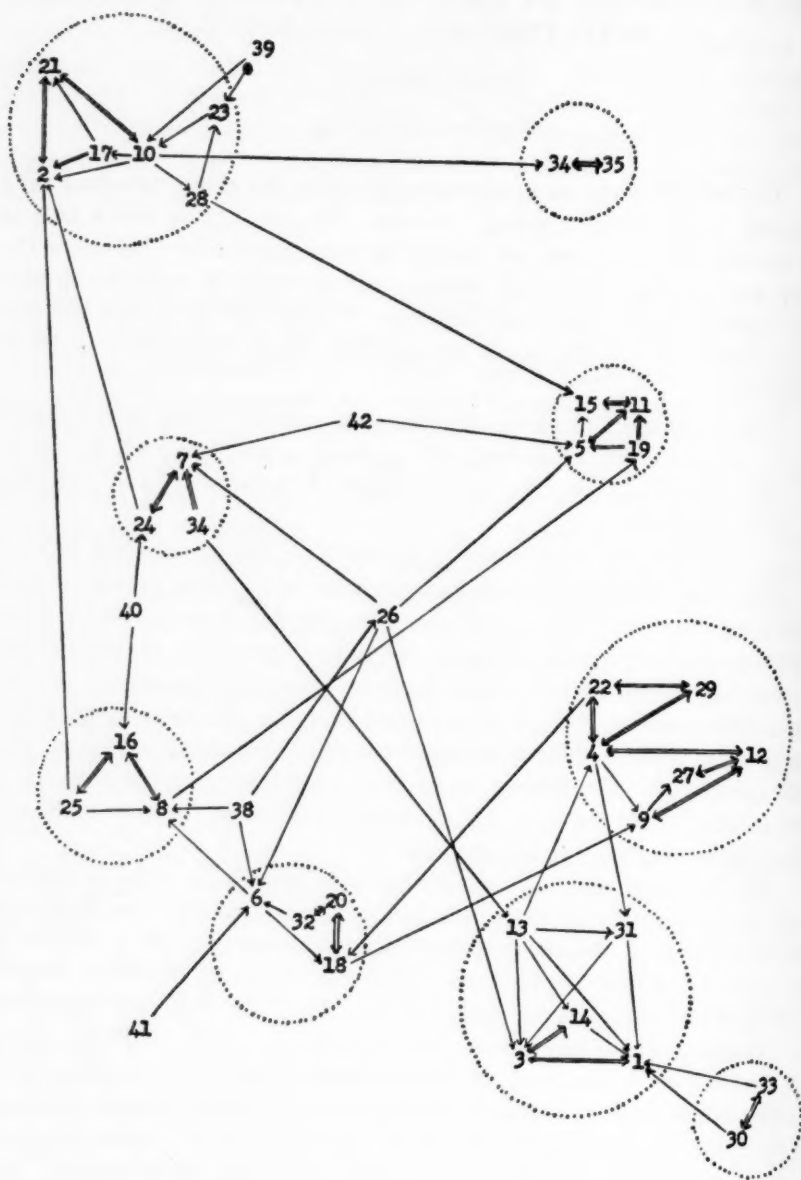
What is the relationship of academic aptitude to such factors as the group structure, the group status of individuals, and mutually chosen friends?

What is the relationship of similarity of interests to these factors?

The data for the study were gathered from two sources. Academic aptitude scores were those found by the *ACE Psychological Examination* administered to the group on its entry into college. Similarity of interests was measured by the *Kuder Vocational Preference Record* administered at the same time. The question, "Whom do you consider to be your best friend within this group?" was asked on three occasions with thirty-day intervals between each questioning. Conclusions as to group structure were based on those choices which were the same for all three questionings. In only four cases did a change in choice of friends occur.

For purposes of study sub-groups were defined as nine in number. Two groups had six members, one had five, two had four, two had three, and two had two. There were three stars (persons selected as friends by five others) and four isolates (persons not selected by any other as a friend). Twenty-three mutual-choice situations were found to exist. See Sociogram.

The total group had a mean raw score of 79.5 on the *ACE Psychological Examination* ($SD=24.8$). The mean times chosen was 2.40 ($SD=1.53$). Results of the *Kuder Vocational Inventory* showed twenty-four of the group to be highest in *social service*, seven in *scientific*, three in *artistic*, two each in *computational* and *outdoor*, and one each in *musical* and *persuasives*. Results were not available in two cases.



Academic Aptitude as a Factor in Popularity. A coefficient of correlation was determined for the popularity (times chosen) and the academic aptitude (ACE score). This r was found to be .024 (SD=.15). However, the mean ACE score for the *stars* was found to be 99.3 (SR=18.3) and for the *isolates*, 62.2 (SD=24.3). The academic aptitude of the *stars* was, therefore, significantly higher than that of the *isolates*.

ACADEMIC APTITUDE AS A FACTOR IN FORMATION OF SUB-GROUPS

The mean and SD of ACE scores were found for each of the sub-groups. Each sub-group was then compared with each other sub-group to find if the differences in means were significant. If these differences were significant, it would indicate that in the population the make-up of friendship groups may be determined on similarity of level of intelligence development.

Thirty-six combinations or comparisons were possible. Of these, 28, or 78 per cent, were found to be significantly different; while 8, or 22 per cent, were not significantly different. Make-up of friendship group is at least partially determined by similarity of level of intellectual development.

Academic Aptitude as a Factor in Mutual Choice. In order to determine the effect of academic aptitude on mutual-choice of friends, the following procedure was used. The difference in academic aptitude for each of the twenty-three instances of mutual choice was found. These were averaged and compared with the average difference in twenty-three randomly-chosen pairs. The average ACE score for the mutually-chosen friends was 20.9 (SD=18.23); for the randomly-chosen pairs was 30.5 (SD=17.20). This test does not show that academic aptitude influences mutual-choice selections.

Interests as a Factor in Sub-Groups and Mutual-Choice Selections. Interests as shown by the *Kuder Preference Record* were studied in relation to sub-group structure and mutual-choice friendships. After the most careful consideration it was not possible to find any relationship between these two factors.

SOCIOMETRY AND EXPERIMENTAL SOCIOLOGY*

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INTRODUCTION

Sociological theory begins with the assumption that groups have a structure of their own and are not figments of individual minds. How can their reality be explored? Field work in residence among the people studied has become, with the aid of sociometric methods, the most productive form of sociological investigation. But it does not always expose to the observer the significant events in a context suitable for objective study. How can this shortcoming be corrected? Theory of action deals with the sum total of motor events that occur in groups and begins with the assumption that the ongoing processes of any collectivity of actors have an internal consistency. But how can these processes be measured? It will be shown that sociological theory and theory of action are like two ends of the same stick, having a common frame of reference and that they can be brought into unison, into a single system. This can be accomplished by changing the customary form of scientific method to meet the particular requirements of a genuine science of man.

DEVELOPMENT OF SCIENTIFIC METHOD

Let us briefly survey the development of scientific method. There have been two phases in the development of scientific method. First there were the observational sciences of astronomy, geology and systematic biology. Then came the experimental sciences of chemistry, physics and experimental biology. It has been necessary for a true science of man to use, in addition to those approaches, a third. An action science of man requires in its crucial parts and basic research, in addition to observational and manipulatory experimental techniques, the development of "autonomous" and "autometric" experimental designs, created of the subjects, for the subjects and by the subjects. But how can the subject's frame of reference be adjusted against that of the observer? What is behavior to the observer is the act to the actor. An action matrix registers acts and events.

*Read at the annual meeting of the American Sociological Society, Urbana, Illinois, September 9, 1954.

A behavior matrix registers "observations" of acts and events. The actor must become an observer of himself and an actor towards the observer. And the observer must become an actor towards the observed and an observer of himself; one must co-act with the other, a meeting is taking place. In an ongoing socio-psychodrama the subjective view of the actor and the objective view of the co-actor are one, they are on the same plane. The methodological problem of the experimental designer within an action science of man is therefore to bring the act into the observer and the observer into the act. This is necessary in order to bring about a meaningful synthesis between sociological theory and a theory of action.

The activities of social scientists are only to a small extent analogous to those of the physical or biological scientists. As far as they overlap the same methods may be used—that is, observation and manipulatory experimental design. The physical sciences leaned in their status nascendi upon practical arts which stimulated their early efforts at conceptualization. New techniques of experimentation appeared closely connected with the practical arts. Astrological cunning fed the development of astronomy; the falling of bodies, the pendulum, etc., stimulated the growth of physical concept and invention. The sciences of man, in order to approximate the success of the physical sciences, have had to abandon physical models. Illustrations for abuses of physical models are psychoanalytic libido theory using the physical law of conservation of energy and the topological Gestalt theory using the physical field theory. I had to look for models among the practical arts which have developed in the area of human relations and which as a matter of course uses man himself as an investigator. I have attempted boldly to choose our models from man's own socio-cultural background from among such practical arts or cultural activities in which he has invested the intuitive wisdom of the ages and which have remained unharnessed for the purpose of scientific method in the social sciences.

THE DRAMA AS A VEHICLE OF ACTION THEORY AND THE EXPERIMENTAL SMALL GROUP LABORATORY

Among the practical human arts, the one which stands out above all is the drama, the word "drama" coming from the Greek, meaning action. The language of the physical sciences is mathematics. The archaic language of the social sciences is the drama.

The drama, as far back as recorded history, is characterized by several unique features: 1) an effort to present the problems of human society

in miniature within a setting removed from reality; 2) the portrayal of human relations in the broader sense of the word, love and matrimony, sickness and death, war and peace, describing a panorama of social cosmos; 3) an instrumentality of realization and objectification of these worlds, the theatre and its allied media. Even that art form which most closely resembles it, the novel, is not linked to such instrumentality as it is a projection technique in words. The drama, because of this astonishing combination of features has been the accumulator of all the intuitive sociocultural inspirations and interpretations, of all the dynamics of human minds, long before the faintest traces of a psychology, psychiatry or sociology began to sprout.*

It is only in recent years, through such media as psychodrama, sociodrama, roleplaying, etc., that it has found scientific usefulness in the area of experimental sociology, small group research and action theory. The extent to which the language of the drama has permeated modern sociology is apparent when one considers some of its terminology, such as act, actor, protagonist, role, situation, dialogue, suspense, catharsis, climax, script, scene, soliloquy, monologue, interaction and many others too numerous to mention.

The neo-dramatic technique of spontaneous roleplaying has been, consciously or unconsciously, the model for numerous varieties of small group research. The subjects of a sociological experiment may be brought together in an attempt to create a society in miniature or some relevant fragment of it. These experimental productions of group activity in statu nascendi which are similar to spontaneous drama show significant features and lend themselves to quantitative measurement and to qualitative analysis. The subjects, because they are doing the scenes themselves, starting from the origin of their feelings for each other and assuming the social roles required by the situations on hand, creating the dialogue, the scenes, the sequences and the climaxes, bring the dynamics of group structure to

* Robert Bierstedt voiced a protest against the current emphasis upon operational methods in sociology from the point of view of the historically oriented sociologist in "The Source of Substantive Sociological Theory", read at the American Sociological Society meeting, Urbana, September, 1954. However, the two positions are not irreconcilable. One of the many ways by means of which they can be brought into a sort of cross-fertilization is by demonstrating the dynamic impact which cultural techniques with a long history as, for instance, the theatre and the drama, have had upon the emergence of operational methods.

life. The vehicle permits every type of interaction to take place between the participant actors, from the most casual and little structured to the most complex human venture.

The groups are intimate, face to face, each member acquainted and potentially interacting with every other. The interactions are initiated by the participants themselves and reflect their "participant culture". The size of the group is a function of the production needs, averaging from two to twenty individuals. At times the groups are permitted to interact without any apparent purpose, wild and chaotic, so as to see what will come of it. The productions emerge in *statu nascendi*, extemporaneously, without prior preparation of the participants. It is of essence to the production that the scenes enacted are real and meaningful to the participants, and real and meaningful within their participant culture. However much we try to keep the research and experimental aspects of these productions apart, it becomes increasingly clear that in order to obtain significant material, significant for the group which cooperates in a particular production, the subjects have to be deeply involved privately, because personal problems are directly treated or indirectly touched, or socially, because certain cultural, ethical and political problems have become deeply anchored in the subjects. Without an existential warmup of the participant actors not only the cathartic benefit of the participants will fail to be accomplished but even more, the research benefit for a material inquiry into the dynamics of group structure will fade out. Here research techniques and action theory are integrated because of their natural relationship.

MEASUREMENT OF INTERACTION

The link between action theory and research is clearly shown when one considers the following factors in the experimental life process. How much "time" does an actor A spend with another actor B? He may spend half as much time with another actor C and three times as much time with another actor D. Or, what is the "spatial distance", near or far, in inches, feet or meters, between actors A, B, C and D in the course of the same situation and what effect have nearness or distance upon behavior and acting? How frequently do two actors appear simultaneously in a scene and how frequently do they exit together? Which are the types of themes, in order of their frequency and degree of stimulation to participation, the ethical, ideological and social content structure of scenes and

the verbal versus the non-verbal content of scenes? Which are the standard situations and social roles dominating a given culture and any of its sub-cultures? What is the duration of a single act, of a co-act, of a whole scene, of a whole drama? A special type of stopwatch was therefore constructed and an interaction diagram, to record interpersonal time and space frequencies so that they could be measured. Magnetic tape and disk were introduced for the objective recording of dialogue and playback (1925). When dealing with time and space relations we could use the standardized time and space units and so the counting seemed to be precise and also meaningful. The premise was that time and space are the dearest properties within the social universe. Therefore, we tried to find out how much time A spends with B and how near in space A is to B. The number of words a person A speaks to a person B were counted and how many words he received from B in return during their mutually allotted time. The word volumes of individuals in various situations and interactions with other individuals were established. A count was made of the number of roles in which they act and which individuals they chose as partners. Items were then counted, things and events for which there was no unit of measurement. We just took a chance on it, thinking that it may find a meaning afterwards. As it turned out after thirty years of research, the important thing was that they were actually counted and that the notion occurred that there must be some significance in these figures. It is this which gradually laid the scientific foundation of sociometry and small group research.

These researches have produced and are still further developing the invisible bond between sociological theory and a true theory of action. On the horizon we can expect greater developments in this union as we further explore the interior dynamics of actional collectives with such scientific methods as psychodrama, sociodrama and roleplaying. The explorations of the deeper dimension of group structure have their foundation in the subsidiary techniques of these methods which include auxiliary ego, role reversal, mirror, soliloquy, the double, future projection, warm-up, spontaneity testing, etc.

Another important consideration facing the action technician are group conflicts or tensions which exist at the time of the experiment. Experimental evaluation may bypass the needs of the moment; its interest is in accurate prediction. Existential evaluation or evaluation in situ is focussed upon the moment and the need for solving an immediate problem.

SUMMARY

The above account is a summary of one of the most salient features of small group research in the last thirty years, which started with Moreno's Stegreif laboratory and the spontaneous interaction diagram (1923), preceding the efforts of Carr (1929), Chapple (1940), Bales (1947), etc, and the research of small groups in numerous laboratories throughout the United States: Harvard University, University of Michigan, New York University, University of Chicago, to mention but a few.

The results of these efforts are: a) Sociological theory and theory of action have been brought into a single system, pointing the way towards an experimental sociology; b) it is found increasingly productive to start with deep material inquiry first and to let the production of hypotheses develop in the course of experimentation. The customary a priori formulation of hypotheses often operates as a cultural conserve on the investigator, blocking his spontaneity in the production of action theory.

REPLY TO DR. THORPE'S "SOME EVIDENCE ON NORTHWAY'S AUTONOMIC HYPOTHESIS"

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It was gratifying to discover that J. G. Thorpe (3) was sufficiently interested in a suggestion which I made several years ago (1) to subject it to experimental investigation. However I am dubious whether the suggestion I made was identical with what Thorpe actually investigated. Indeed my suggestion and the hypothesis he sets up for his study appear to me to be different.

In our study, when we selected children who had low acceptance scores and observed them clinically, we found among them recessive children, (who typically withdrew from social situations); and aggressives (who attacked social situations in an inefficient manner). Our theory stated that both of these patterns emerged as attempted means to deal with failure in social learning. We then raised the question—why did some children develop one pattern and others the opposite? We ventured to "hazard an opinion" (which Thorpe refers to as our "bold hypothesis") that this might be due to an original organic difference in the dominance of the autonomic nervous system and suggested that "it would be well worthwhile to investigate the autonomic dominance of *infants*." (1)

My point of view could be sharpened into the following hypotheses: (a) that there are differences in autonomic dominance of those infants who usually withdraw and those who usually attack a frustrating situation; (b) that such differences are related to clinical patterns of recessivism and aggression that are later developed.

To demonstrate these hypotheses would not require a very complicated experimental design; it would however require a laborious and a long-term type of longitudinal study.

Thorpe's hypothesis appears to be that children of sociometric pattern "zero" differ from children of sociometric pattern $+ \angle -$, on measures of autonomic dominance. His investigation consisted of taking 28 school children (age not given) who were neither chosen nor rejected, whom he calls recessives, and sixteen children who were disliked more frequently than they were chosen, whom he calls aggressives. He then subjected each group to Wenger's autonomic measures of sublingual temperature and

salivary pH. As he finds no significant difference between the groups he concludes that my hypothesis ("tentative suggestion") is not supported.

Thus while I agree that Thorpe's data do not support *his* hypothesis, I consider that they are merely irrelevant to mine.

There are two comments which I would like to make from this.

(1) In attempting to obtain facts which are stamped by the hallmark of sound experimental design we may all too often have to sell their birth-right of psychological significance.

It is quite correct scientifically to compare individuals whose sociometric choices are 0 with those whose are $+ \angle -$, on any other variable,* but it is not yet proven that 0 and $+ \angle -$ have any great psychological significance; indeed it is questionable that they are identical with what the clinical nomenclature recessive and aggressive imply; and as recent studies have shown (2) the category "recessive" covers a multitude of variations.

Although sociometric facts are extremely useful information for the clinician to include in making a diagnosis, it would be as inappropriate to use sociometric measures alone, as it would be to use an intelligence test alone, to make a full personality appraisal.

(2) Our second point concerns the old problem of label and entity. To me it would have been most surprising if Thorpe had found an autonomic difference in "recessive" and "aggressive" children unless his measures were made in a *situation* causing some frustration or tension to the children. Recessivism is a convenient label to give to a child who when confronted with frustration tends to withdraw. It is, however, a label not an entity. A child whom we classify as recessive is not showing withdrawing behaviour every moment of the day and night. Such classifications may be useful to psychiatrists, clinical psychologists and writers who are looking for descriptive terms, but they are a label and not an entity.

Thorpe has established the fact that children classified by sociometric choice as 0 and $+ \angle -$ do not show autonomic difference when tested in an undescribed situation, but this does not really contribute very much to our knowledge of human beings. It does not tell us whether or not autonomic difference in infants leads to later patterns of recessivism and aggression. Thus I cannot see that he has disproved my suggestion, merely his own hypothesis. Indeed we are still left with the original question of 1946

* It should, however, be noted that zero represents the same sociometric patterns for all cases, but that choice-less-than rejections may vary from 2 rejections-one choice to 20+ rejections and one choice.

—why do some children when confronted with social frustration typically withdraw and others violently attack? If it is not due originally to autonomic balance—and I would agree with Thorpe's conclusion although from different evidence, to what is it due? The contributions from clinical work with children now provide many clues; they have not yet furnished an answer.

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ANNOUNCEMENTS

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